

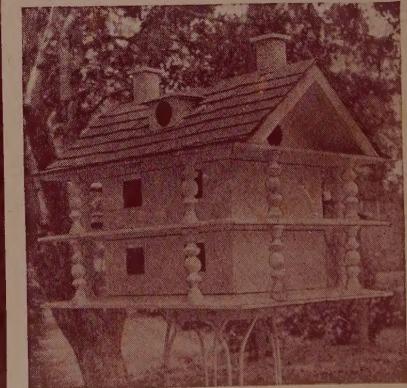
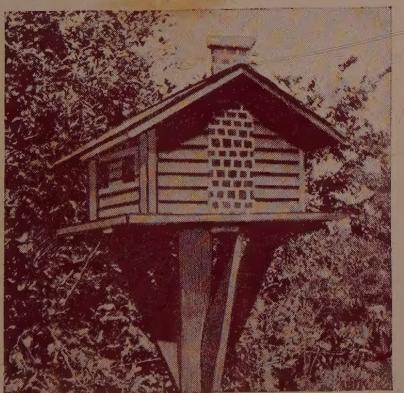


*By*  
*Gladstone Calif*

• • • •



# PERMANENT BIRD HOUSES



## Permanent Bird Houses

This is a plan book for building all-year birdhouses. The author tells how to build bird houses, the essentials of a bird house, finishing bird houses, and gives other interesting data regarding them. Each bird house is well planned, with a proper provision for cleaning and ventilating, a detailed bill of material, a photograph of the house, and detailed construction drawings.

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**PERMANENT BIRD HOUSES**



# PERMANENT BIRD HOUSES

GLADSTONE CALIFF,

*Instructor Woodworking,  
Senior High School, Quincy, Illinois*



THE BRUCE PUBLISHING COMPANY,  
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Copyright, 1924  
The Bruce Publishing Company  
Printed in the United States of America  
(Eighth Printing — 1948)

*This book is affectionately dedicated to the  
memory of my Mother.*

“The little bird sits at his door in the sun  
Atilt, like a blossom among the leaves,  
And lets his illumined being o’errun  
With the deluge of summer it receives:  
His mate feels the eggs beneath her wings,  
And the heart in her dumb breast flutters and sings:  
He sings to the wide world, and she to her nest  
In the nice ear of nature which song is the best.”

*From The Vision of Sir Launfal, Lowell.*

## INTRODUCTION

Within the last twenty years the people of the United States have changed radically in their interest towards bird life. They now appreciate that birds are not only lovely in color and song, but that they are very necessary from an economic standpoint. Sponsored by the Audubon Society of America, educational programs have been developed in the public schools by the Boy Scouts of America, by numerous women's clubs, and others, where the study of bird life has become an interesting feature. The result is that nearly every town has its bird club.

As the interest in wild life increased, means of attracting the birds were sought. It was soon learned that during the winter time, suet placed on trees would attract such birds as the titmice, woodpeckers, and nuthatches. Feeding shelves were constructed where bountiful supplies of bird seeds, cracked nuts, and crumbs added such birds as the chickadees, red-birds, and creepers, to the interesting list of visitors.

As spring came, a desire to keep the feathered friends of the winter forced the inexperienced bird

lovers to demand a box or home which would really fit the needs of the different varieties of birds which had wintered with them. A number of companies soon organized over the United States to build and sell bird homes in a commercial way. Many of their early bird houses were made from designs imported from Germany. Ingenious builders in America quickly increased the numbers of varieties and shapes of their houses. Many of these houses were scientifically built, and were worthy of a place in any yard. However, too many others were not made to meet the requirements of the nesting birds, but were in reality only ornate little decorations.

School boys next began the building of bird houses. Every teacher of manual training was soon besieged with requests for bird-house designs. As the available plans were few in number and very plain in design, an increasing demand for a book which would supply diagrammed outlines of houses, both ornate and scientifically constructed, made itself felt.

Mr. Califf recently made a trip to Quincy, and placed all of the designs which are embodied in this book before me so that I had the chance to give them some study. His boxes have been carefully thought out, not only from the standpoint of manual-training theory, but he has considered their structure primarily from the standpoint of the bird. The result is, that the interiors are of correct depth and width, with specifications for proper ventilation.

The many people who have built these boxes from his plans and have used them, report that the

houses have been quickly rented, and the fact that apparently the same birds return from year to year seems proof that the houses are permanently satisfactory. Knowing these facts, I am glad to recommend these plans to teachers of manual training who can give them to their classes with the assurance that once a student has finished a house, he has something which is correct, not only from the master-builders' standpoint, but from the standpoint of the birds as well.

T. E. MUSSelman, A. M.  
Quincy, Ill.

#### ACKNOWLEDGMENT

The author wishes to express his gratitude and appreciation to T. E. Musselman of Quincy, Ill., for the introduction, the article on natural wood boxes with the accompanying photograph, and his many helpful suggestions; to Arthur Christensen of Fairfield, Iowa, for making the plates; to Richard Malcomson of Frederick, Ill., for material and statistics on page 47; also to Mrs. Califf for her encouragement and cooperation.

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## PERMANENT BIRD HOUSES

### BIRD HOUSE CONSTRUCTION

**B**EFORE building a bird house, the maker should have in mind the kind of house he is going to make; whether it is for martins, bluebirds, or wrens. An architect, when planning a house, must know whom he is working for, the size of the family and the particular taste of the occupants. The same applies to bird houses.

### ESSENTIALS OF A BIRD HOUSE.

1. House built for certain kind of bird.
2. Correct amount of floor space.
3. Proper depth of house.
4. Right sized entrance, proper distance from floor.
5. Arrangements for cleaning.
6. Means provided for ventilation.
7. Good exterior finish.
8. Smooth interior, free from nails.

9. Good construction, tight joints.

10. Quarter-inch hole bored in floor of house for escape of moisture.

If it is desired to make a house practical, it must be built for a certain type of bird. A house that would suit a family of martins would not suit a family of wrens. Each bird builds a different kind of nest which varies in size and shape.

### CONSTRUCTION

The house should be built of good material to make it durable. Cypress, poplar and white pine are excellent materials. They are cheap in price, easy to work, and weather well. The joints should be tight to prevent drafts. Nails and screws should be set in and puttied over. Bird houses should be built with the idea of giving the birds forty years of service.

## FINISHING BIRD HOUSES

The bird houses described in this book may be finished as follows: A martin house may be painted white as that has proved to be a satisfactory color. The paint protects the wood and the birds take to this color. A number of martin houses finished with white paint by the author were all occupied. An old established firm that specializes in the manufacture of bird houses finishes martin houses with white paint. Martins will also build in rustic houses.

Bluebirds will build in a house that is finished in brown, gray, or green. They prefer these colors to any other. They also like rustic houses.

The wren will build in a house of most any color. The colors, brown, gray and green are recommended because they blend with the landscape and do not make the house so conspicuous. The wren will build in anything from a coat pocket to an empty shoe.

Rustic houses, made by nailing bark on the outside, generally prove unsatisfactory. A house made in this fashion draws and holds dampness, and the bark becomes worm eaten and drops off, lasting but

a season or two. Do not confuse this type of house with natural wood boxes. Natural wood boxes are made from a hollow branch or some part of a tree and are covered with natural bark. This type of house generally weathers well and makes an excellent home for birds preferring rustic houses. Any type of bird box can be made rustic by staining the outside dark and applying two or three coats of spar varnish.

## DON'TS FOR BIRD HOUSE BUILDERS

1. Don't place a martin house in or near a tree or other obstruction. It may be placed from fifteen to fifty feet in the air, situated so as to allow the martins to circle.
2. Don't make the porches on a martin house too narrow.
3. Don't make the opening in a wren house less than  $\frac{7}{8}$ " in diameter. It should be the size of a quarter of a dollar. English sparrows cannot force themselves through such an opening.
4. Don't build a house unless some way is provided for cleaning and ventilating it.
5. Don't paint the inside of a bird house.

6. Don't fail to cover the entrance to a martin house with cardboard or screen after the martins leave in the late summer. Open again at the date of arrival in the spring. This keeps the sparrows from using the building for winter sleeping quarters and eventually building their nests before the martins have time to establish themselves.

7. Don't make the perches square. A round perch is superior.

8. Don't place a house made of tin or with a tin roof directly in the sun. Better build with wood.

9. Don't have ventilating holes lower than the entrance.

10. Don't make the entrance on a level with the floor, as the young birds are in danger of falling from the nest.

11. Don't place the houses too close together.

12. Don't have more than one entrance to each room.

13. Don't place a railing around the porch of a martin house.

14. Don't leave the inside of the house rough. It should be smooth and free from nail points.

15. Don't fail to bore a quarter inch hole in the floor of each house to allow the escape of moisture.

16. Don't make the perch on a wren house too long. It should be short to prevent larger birds from standing on the perch and attacking the young in the nest.



FIG. 1—STUCCO BIRD HOUSE

## STUCCO HOUSES

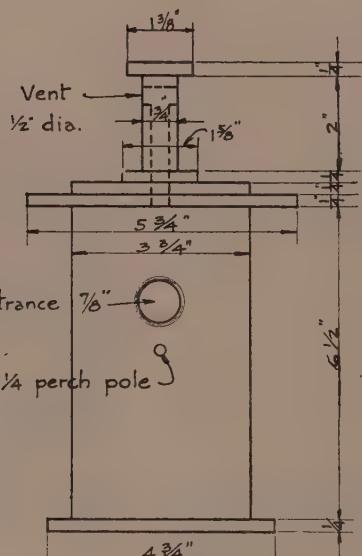
A great number of bird houses made today are stuccoed. (Figs. 1 and 2.) In some cases this is de-



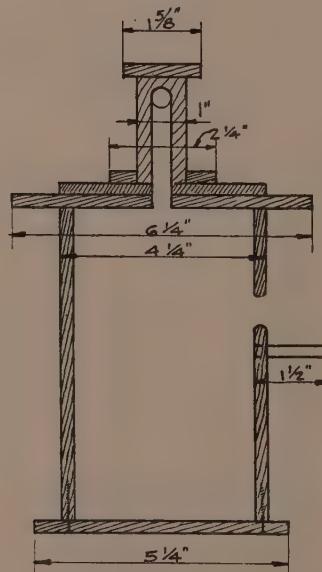
JUSTAMERE  
WREN HOUSE

BILL OF MATERIAL

- 4 PC  $1/4" \times 3\frac{1}{4}'' \times 6\frac{1}{2}''$  SIDES
- 1 PC  $1/4" \times 4\frac{3}{4}'' \times 5\frac{1}{4}''$  BOTTOM
- 1 PC  $1/4" \times 5\frac{3}{4}'' \times 6\frac{1}{4}''$  TOP
- 1 PC  $1/4" \times 3\frac{3}{4}'' \times 4\frac{1}{4}''$  "
- 1 PC  $1/4" \times 1\frac{3}{8}'' \times 2\frac{1}{4}''$  "
- 1 PC  $3/4" \times 1" \times 2\frac{1}{4}''$  NECK
- 1 PC  $1/4" \times 1\frac{3}{8}'' \times 1\frac{1}{8}''$  CAP
- 1 PC  $1/4" \times 1\frac{1}{2}''$  ROUND PERCH
- 4  $3\frac{3}{4}'' \#4$  FLAT HEAD SCREWS



ELEVATION



VERTICAL SECTION

One-fourth actual size

Note: Bottom comes off for cleaning

sirable in order to have it match the owner's home. The ordinary method of stuccoing a bird house is the same as that used on a residence. This is done by using some material on the outside to hold the cement which is then given a pebble dash finish.



FIG. 2—STUCCO BIRD HOUSE

This method takes considerable labor, and one not accustomed to using cement may put on a poor finish. Likewise a small house is difficult to stucco on account of small places being hard to reach.

A bird house, however, can be given a simple stucco finish in the following way. The materials needed are ordinary ground oyster shell, called

"chicken grit," which has been ground rather fine, together with a good grade of thick lead and oil paint. For light stucco give the house a priming coat of white paint. After allowing ample time for drying, apply a second coat of paint, thicker than the first; then spread the grit over the painted surface. It will resemble stucco and also stand the changes of weather.

A board, which was stuccoed as described above, was placed in a bucket of water for several days. At the end of that time it was taken out of the water, when dry, the grit stuck to the wood as well as before soaking in water. A house, which was stuccoed in this way, was left out all season; at the end of the year it was in as good condition as when put out.

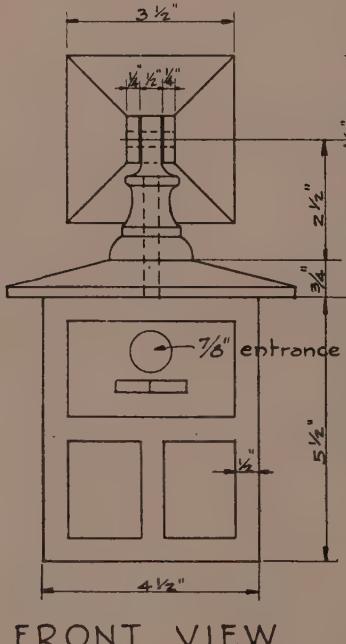
If brown stucco is desired, the grit can be held with brown paint, and painted brown after the first coat has dried. The grit can be painted to resemble any color of stucco. The white stucco is most easily imitated. It is easy to apply, and can be done for a small sum. A house finished in this way is not much heavier than an ordinary wood house, and much lighter than one stuccoed with cement.



THE LANTERN  
WREN HOUSE

BILL OF MATERIAL

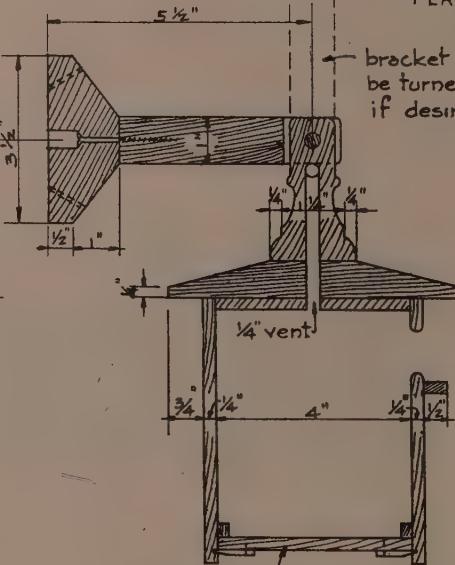
2	PC	$1\frac{1}{4}'' \times 4'' \times 5\frac{1}{2}''$	SIDES
2	PC	$1\frac{1}{4}'' \times 4\frac{1}{2}'' \times 5\frac{1}{2}''$	"
1	PC	$1\frac{1}{4}'' \times 4'' \times 4''$	BOTTOM
2	PC	$1\frac{1}{4}'' \times 1\frac{1}{2}'' \times 4''$	TOP
1	PC	$1\frac{1}{4}'' \times 4'' \times 4''$	"
1	PC	$3\frac{1}{4}'' \times 6'' \times 6''$	BRACKET
1	PC	$1\frac{1}{2}'' \times 3\frac{1}{2}'' \times 3\frac{1}{2}''$	ARM
1	PC	$1'' \times 1'' \times 5''$	PERCH
1	PC	$\frac{1}{4}'' \times 1\frac{1}{2}'' \times \frac{1}{2}''$	DOWEL
1	PC	$\frac{1}{4}'' \times 1''$	
1	TURNING		
1	2" SCREW #14		
2	WOODEN BUTTONS		



FRONT VIEW



SKETCH OF  
BUTTON



removable bottom held in place  
by wood buttons.

VERTICAL SECTION

Note: Panels & borders to be  
painted different colors.

One-fourth actual size.

PLATE II

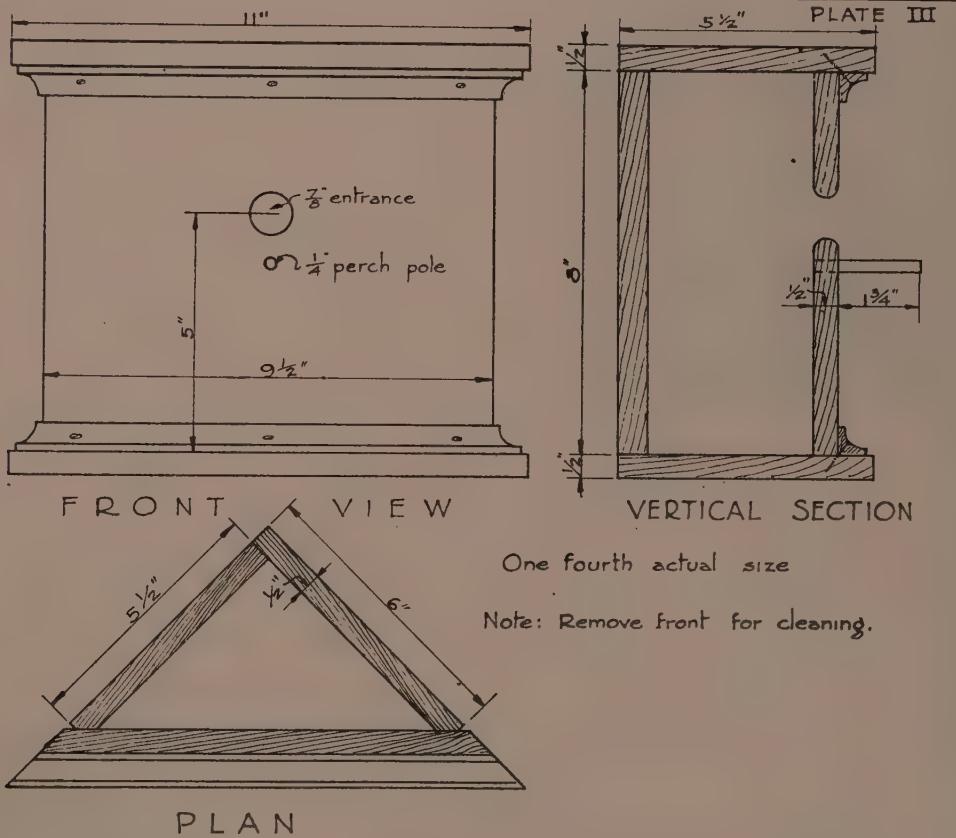
bracket can  
be turned up  
if desired



## CORNER WREN HOUSE

### BILL OF MATERIAL

- 2 PC  $1\frac{1}{2}'' \times 7\frac{3}{4}'' \times 7\frac{3}{4}'' \times 11''$  TOP & BOTTOM
- 1 PC  $1\frac{1}{2}'' \times 5\frac{1}{2}'' \times 8''$  BACK
- 1 PC  $1\frac{1}{2}'' \times 6'' \times 8''$  "
- 1 PC  $1\frac{1}{2}'' \times 9\frac{1}{2}'' \times 8''$  FRONT
- 2 PC 11" COVE MOLD
- 1 PC  $1\frac{1}{4}'' \times 2\frac{1}{4}''$  ROUND PERCH
- 6  $1\frac{1}{2}''$  SCREWS

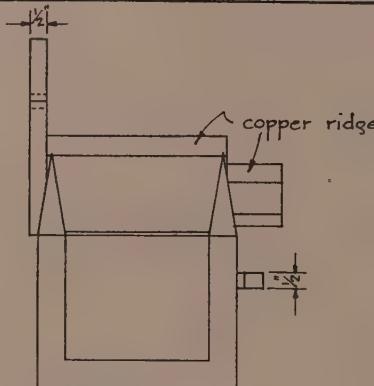




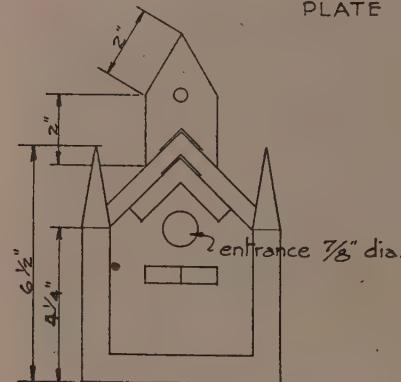
## CATHEDRAL WREN HOUSE

### BILL OF MATERIAL

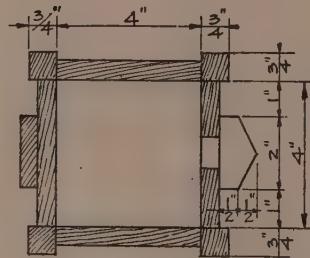
1 PC	$1/2" \times 4" \times 4"$	BOTTOM
4 PC	$3/4" \times 3/4" \times 4"$	RAIL
4 PC	$3/4" \times 3/4" \times 6 1/2"$	SPIRES
2 PC	$1/2" \times 4" \times 3 1/2"$	SIDES
2 PC	$1/2" \times 4" \times 5 1/2"$	ENDS
1 PC	$1/2" \times 3 1/4" \times 5"$	ROOF
1 PC	$1/2" \times 3 3/4" \times 5"$	"
1 PC	$1/2" \times 2" \times 5 1/2"$	HANGER
1 PC	$1/2" \times 1" \times 2"$	PERCH
1 PC	$1/2" \times 1 1/2" \times 1 1/2"$	HOOD
1 PC	$1/2" \times 2" \times 1 1/2"$	"
	$1/2" \times 6 1/2"$	COPPER SHEET



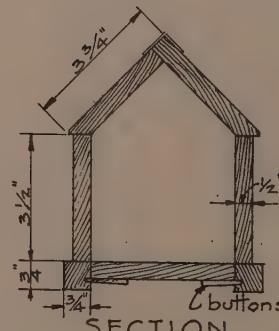
SIDE VIEW



FRONT VIEW



PLAN



SECTION

Note: Bottom comes out for cleaning.

Scale  $3/16" = 1"$

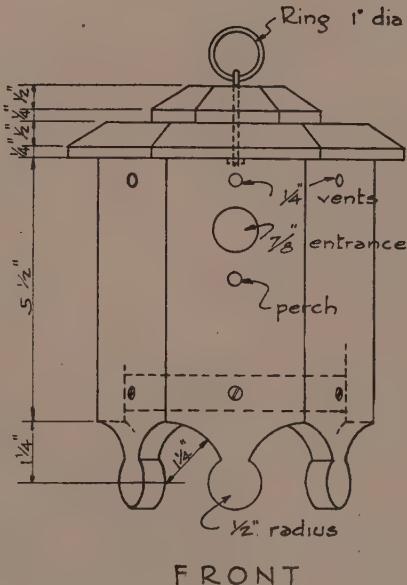


## THE HEXAGON

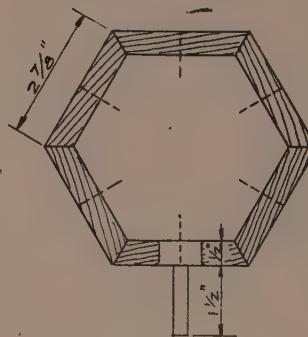
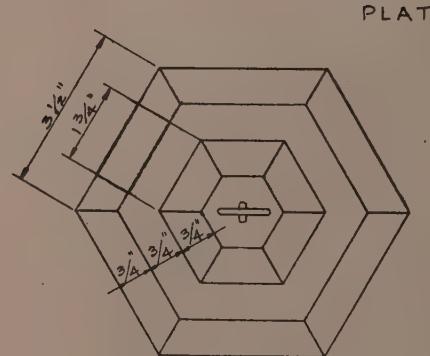
### WREN HOUSE

#### BILL OF MATERIAL

- 6 PC  $1\frac{1}{2}'' \times 2\frac{1}{8}'' \times 7\frac{1}{2}''$  SIDES
- 1 PC  $3\frac{1}{4}'' \times 4\frac{1}{2}''$  HEXAGON BOTTOM
- 1 PC  $3\frac{1}{4}'' \times 7''$  TOP
- 1 PC  $3\frac{1}{4}'' \times 3\frac{1}{2}''$  "
- 1 PC  $1\frac{1}{4}'' \times 2''$  ROUND PERCH
- 1 1" DIAMETER RING
- 1  $3\frac{1}{8}'' \times 2''$  EYE BOLT
- 6 1" #6 FLAT HEAD SCREWS



Note: Lay out hexagons by drawing circle with radius equal to side of hexagon



One fourth actual size

PLATE V

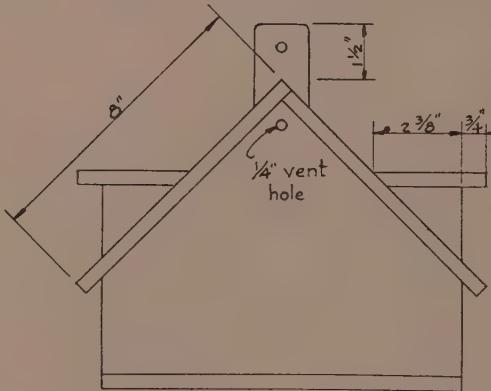


## THE DUPLEX

### 2 ROOM WREN HOUSE

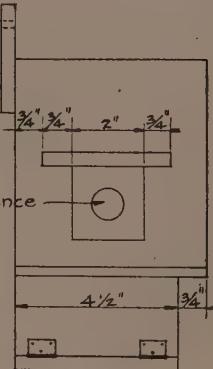
#### BILL OF MATERIAL

1 PC $96'' \times 4\frac{1}{2}'' \times 10''$	BOTTOM
2 PC $36'' \times 3'' \times 3\frac{3}{4}''$	ENDS
2 PC $36'' \times 7\frac{1}{2}'' \times 10''$	FRONT & BACK
2 PC $36'' \times 5\frac{1}{4}'' \times 8''$	ROOF
2 PC $36'' \times 3\frac{1}{2}'' \times 3\frac{1}{8}''$	DORMER ROOF
2 PC $36'' \times 2'' \times 2''$	" FRONT
4 PC $36'' \times 2'' \times 2''$	" SIDES
2 PC $36'' \times 3\frac{3}{4}'' \times 7\frac{1}{2}''$	PARTITION
1 PC $36'' \times 1\frac{1}{2}'' \times 3''$	HANGER
1 PAIR HINGES	
1 HOOK AND EYE	

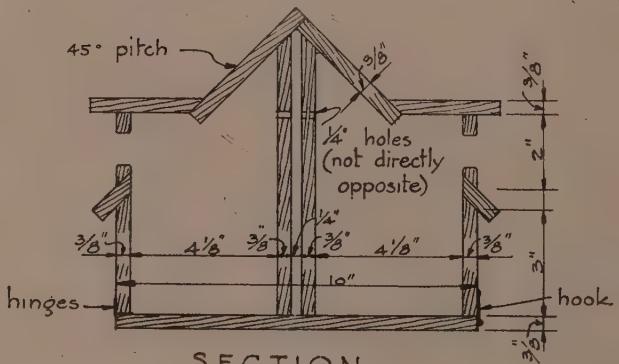


FRONT VIEW

PLATE VI



SIDE VIEW



SECTION

Scale  $3\frac{1}{16}'' = 1''$

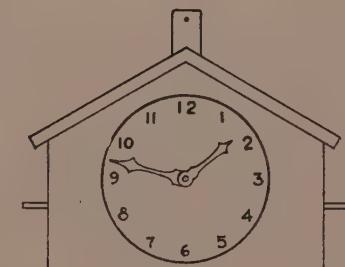


## THE "CLOCK"

TWO ROOM WREN HOUSE

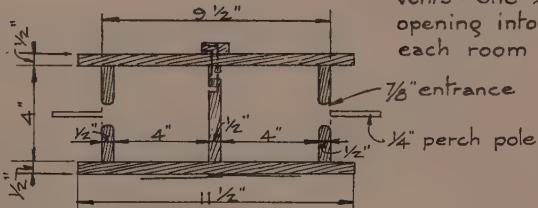
BILL OF MATERIAL

1	PC	1/2" x 4" x 9 1/2"	BOTTOM
2	PC	1/2" x 1 1/2" x 9"	FRONT & BACK
2	PC	1/2" x 4" x 5"	SIDES
1	PC	1/2" x 4" x 7 1/2"	PARTITION
2	PC	1/2" x 6 1/2" x 7 1/2"	ROOF
2	PC	1/4" ROUND x 2 1/2"	PERCH
1	PC	1/2" x 1" x 6"	HANGER
2 TIN CLOCK HANDS			
1		HINGE	
1		HOOK	
2		PINE CONES	
7"		SASH CHAIN	



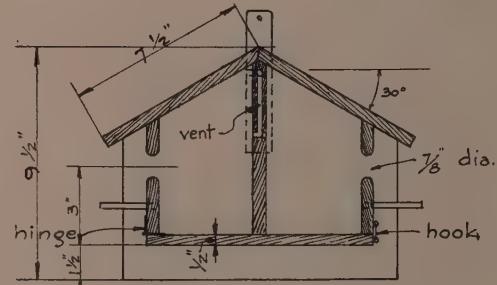
painted  
pine cones

FRONT VIEW

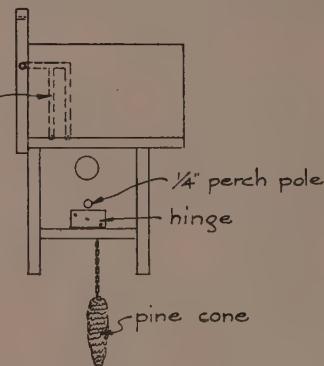


## PLAZA

Note: Clock face to be painted  
Hands to be cut from metal



## VERTICAL SECTION



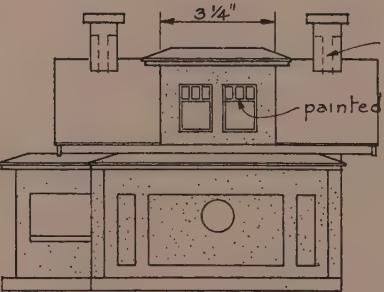
SIDE VIEW

Scale  $\frac{1}{2}'' = 1'$

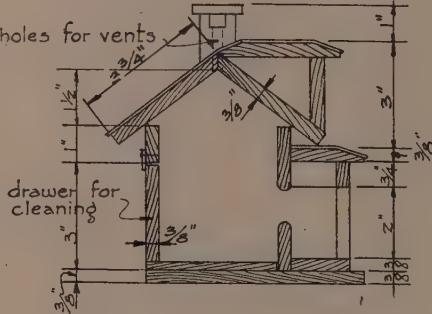


## BUNGALOW WREN HOUSE

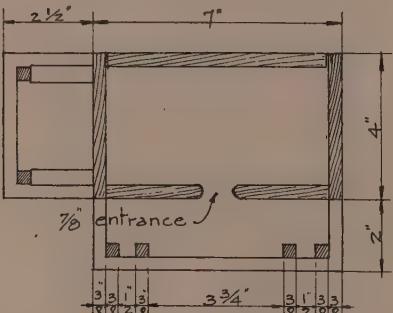
BILL OF MATERIAL		
1 PC	36" x 6" x 9 1/2"	BOTTOM
1 PC	36" x 1 1/2" x 6 1/2"	PORCH FLOOR
1 PC	36" x 2 1/2" x 3 1/4"	" "
2 PC	36" x 4" x 5 1/2"	FRONT
1 PC	36" x 6 1/4" x 4"	DRAWER
1 PC	36" x 6 1/4" x 2 3/4"	BACK
1 PC	36" x 6 1/4" x 1"	DRAWER BOTTOM
1 PC	14" x 3 3/8" x 6 1/4"	FRONT PORCH ROOF
1 PC	36" x 4" x 7"	" "
4 PC	36" x 3 3/8" x 2"	POSTS
1 PC	36" x 3 3/8" x 6 1/4"	BEAM
2 PC	36" x 3 3/8" x 1 1/4"	" "
2 PC	36" x 1" x 2 1/8"	SIDE
2 PC	36" x 3 3/8" x 1 1/8"	POSTS
2 PC	36" x 3 3/8" x 1 1/4"	BEAM
1 PC	36" x 3 3/8" x 3 1/4"	" "
2 PC	14" x 1 1/2" x 1 1/8"	RAIL
2 PC	3 1/4" x 3 3/8" x 8 1/2"	ROOF
1 PC	36" x 3 1/2" x 4"	DORMER ROOF
1 PC	36" x 3 1/4" x 2 1/4"	" FRONT
2 PC	36" x 2 1/2" x 1 1/4"	" SIDES
2 PC	34" x 1" x 1 1/2"	CHIMNEY
2 PC	14" x 1" x 1 1/4"	" CAP
OYSTER SHELLS ON FRESH PAINT FOR STUCCO		



FRONT VIEW



VERTICAL SECTION



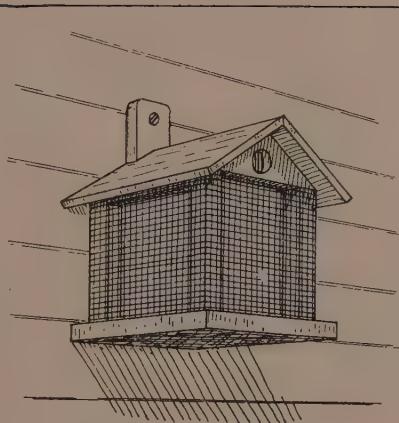
PLAN



SIDE VIEW

Scale  $3/16" = 1'$

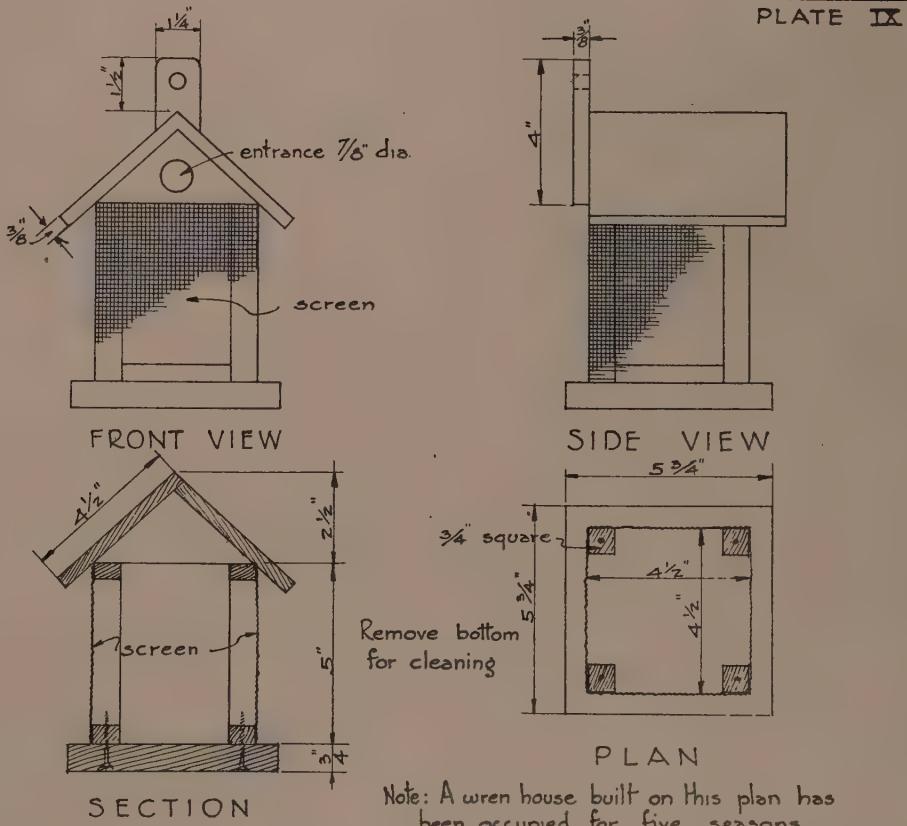
PLATE VIII



### SUMMER HOME FOR JENNY WREN

#### BILL OF MATERIAL

1 PC	$3\frac{1}{4}'' \times 5\frac{3}{4}'' \times 5\frac{3}{4}''$	BOTTOM
4 PC	$1\frac{1}{2}'' \times \frac{3}{4}'' \times 3''$	SILLS
2 PC	$1\frac{1}{2}'' \times \frac{3}{4}'' \times 3''$	PLATE
4 PC	$\frac{3}{4}'' \times \frac{3}{4}'' \times 5''$	POSTS
2 PC	$\frac{3}{4}'' \times 4\frac{1}{2}'' \times 2''$	GABLES
1 PC	$3\frac{1}{8}'' \times 4'' \times 5\frac{1}{2}''$	ROOF
1 PC	$\frac{3}{8}'' \times 4\frac{1}{2}'' \times 5\frac{1}{2}''$	"
1 PC	$\frac{3}{8}'' \times 1\frac{1}{4}'' \times 4''$	HANGER
1 PC	$5'' \times 19''$	SCREEN
4	$1\frac{1}{2}''$	SCREWS #10



Note: A wren house built on this plan has been occupied for five seasons.

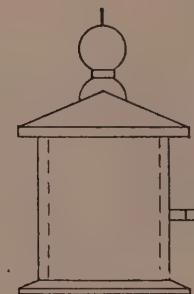
Scale  $\frac{3}{16}'' = 1\text{-}0''$



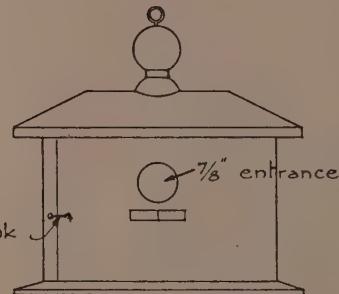
## OBSERVATION WREN HOUSE

### BILL OF MATERIAL

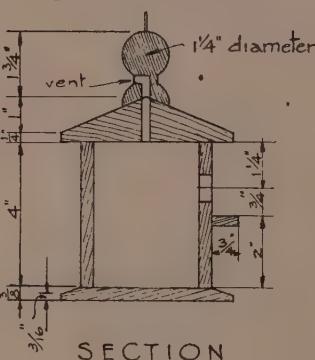
1 PC	$36'' \times 4\frac{3}{4}'' \times 8''$	BOTTOM
2 PC	$36'' \times 5\frac{3}{4}'' \times 4''$	SIDES
2 PC	$36'' \times 3\frac{5}{8}'' \times 4''$	ENDS
1 PC	$1\frac{1}{4}'' \times 4\frac{3}{4}'' \times 8''$	TOP
1 PC	$\frac{1}{4}'' \times 3\frac{1}{4}'' \times 1\frac{1}{2}''$	PERCH
1 PC	$3\frac{1}{8}'' \times 4''$	GLASS
1 PAIR	HINGES	
1	HOOK	
1	KNOB	
1	EYE	



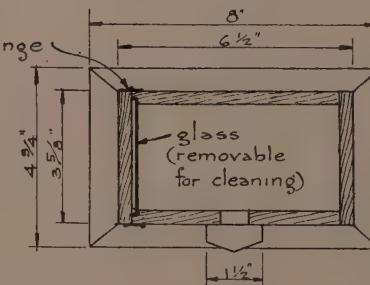
SIDE VIEW



FRONT VIEW



SECTION



PLAN

Scale  $\frac{3}{16}'' = 1''$

## WREN HOUSE

A wren house should have the following dimensions: Floor 4" x 4"; depth 6" to 8"; entrance should be from 1" to 6" above the floor, and the diameter  $\frac{7}{8}$ ". This is large enough for a wren and too small for a sparrow, which makes the wren house sparrow-proof. Most wren houses are provided with a perch, although the bird can manage without one. The perch helps the bird, especially when building, as it furnishes a landing place when putting in the nesting material. The house should be placed 6 to 10 feet above the ground. (Plates I to X.)

## BLUEBIRD HOUSE

A bluebird house should have the following dimensions: Floor 5" x 5"; depth 8"; entrance should be from 2" to 6" above the floor, and the diameter  $1\frac{1}{2}$ ". A bluebird house is more practical if it has a perch, but it is not absolutely necessary. If the wood is painted it makes a smooth surface but is harder for the bird to obtain a footing. A bluebird will build in a swinging house which the English sparrow does not like, thus protecting the bluebird from these pests. The house should be placed 5 to 10 feet above the ground. (Plates XI to XVII.)

## MARTIN HOUSE

The rooms in a martin house should have the following dimensions: Floor 6" x 6"; depth of room 6"; entrance  $2\frac{1}{2}$ " in diameter. The martin is a medium sized bird and requires a large entrance. Experience has proven that 2" is the proper distance for the entrance to be placed above the floor. An entrance placed on a level with the floor endangers the young birds which might fall out of the nest. Likewise the higher entrance prevents rain from blowing in upon the nest.

A porch from 4" to 6" wide on a martin house is a necessity. The martin enjoys a wide porch on which it can rest in the sun. Never place a railing around this porch. The house should be 15 to 20 feet from the ground.<sup>1</sup> (Plates XVIII to XXVb.)

## VENTILATION

A bird house should be ventilated as it makes the house more healthful. In a small house with one

<sup>1</sup>The dimensions of the foregoing houses were taken from U. S. Department of Agriculture, Farmers' Bulletin No. 609.

The entrance to the bluebird house is given in the government bulletin as 6" above the floor, and the entrance to the martin house as 1" above the floor, but experience has proven that the dimensions given in the drawings are more practical.

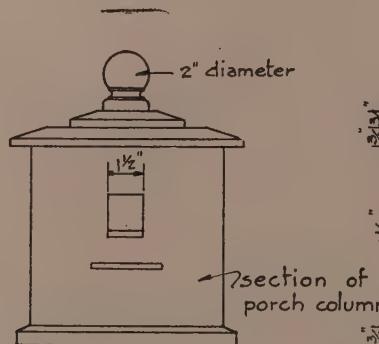


### THE ROUND HOUSE

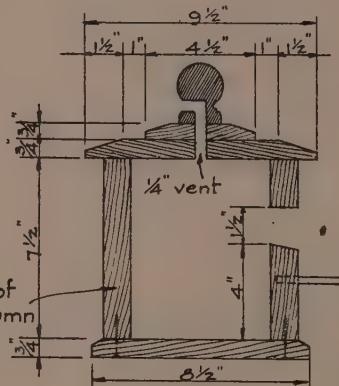
#### BLUEBIRD HOUSE

##### BILL OF MATERIAL

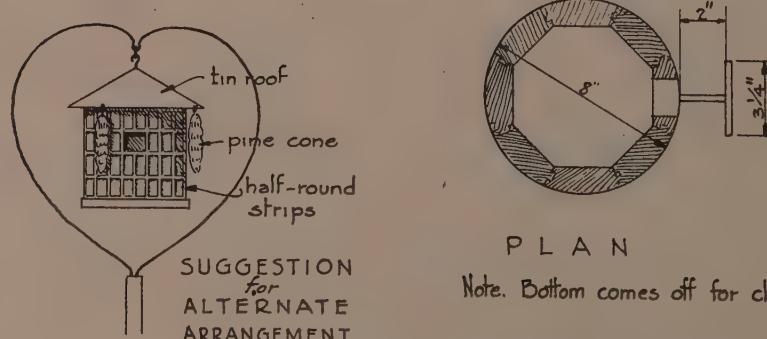
- 1 7½" SECTION OF 6" PORCH COLUMN
- 1 PC 3/4" x 8½" DIAMETER BOTTOM
- 1 PC 3/4" x 9½" " TOP
- 1 PC 3/4" x 4½" " "
- 1 PC 1/4" x 3" ROUND PERCH
- 1 PC 1/4" x 3½" " "
- 1 KNOB
- 3 2" #11 SCREWS



FRONT VIEW



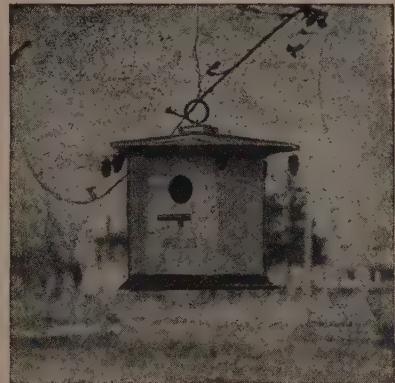
SECTION



PLAN

Note. Bottom comes off for cleaning

Scale 1/8" = 1"

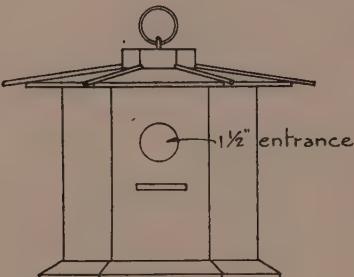


## JAPANESE LANTERN

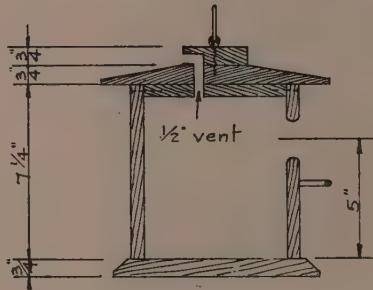
### BLUEBIRD HOUSE

#### BILL OF MATERIAL

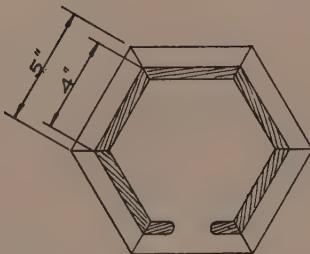
6 PC	$\frac{1}{2}'' \times 4'' \times 7\frac{1}{4}''$	SIDES
1 PC	$\frac{3}{4}'' \times 10''$	HEXAGON BOTTOM
1 PC	$\frac{3}{4}'' \times 11''$	" TOP
1 PC	$\frac{1}{2}'' \times 7''$	" "
1 PC	$\frac{3}{4}'' \times 3''$	" "
6 PC	$\frac{1}{4}'' \text{ ROUND} \times 5''$	HIP
2 PC	$\frac{1}{4}'' \text{ " } \times 2''$	PERCH
1	RING WITH SCREW EYE	



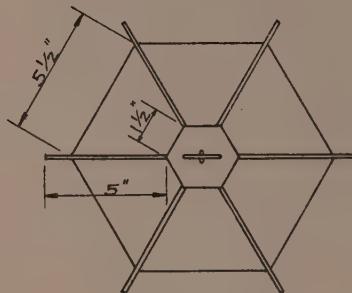
FRONT VIEW



SECTION



PLAN



TOP VIEW

Note: Remove top  
for cleaning

Scale  $\frac{1}{8}'' = 1''$

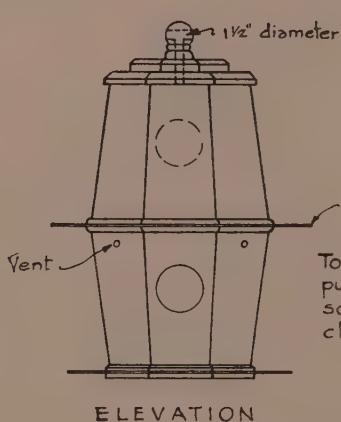
PLATE XII



**"OCTAGON"**  
TWO ROOM BLUEBIRD HOUSE

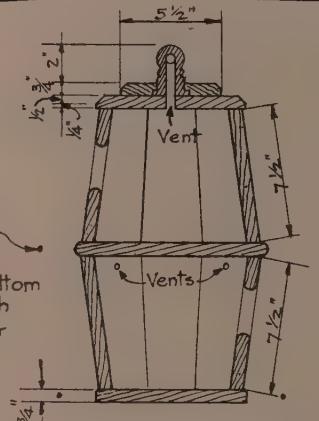
BILL OF MATERIAL

12	PC	34" x 3 1/4" to 4" x 7 1/2"	SIDES
1	PC	34" x 8 1/2" OCTAGON	BOTTOM
1	PC	34" x 10 1/2" "	2ND FLOOR
1	PC	34" x 8 1/2" "	TOP
1	PC	34" x 5 1/2" "	"
8	PC	1/4" x 2 1/2"	PERCH POLES
90"	WIRE	"	RINGS
1	KNOB		

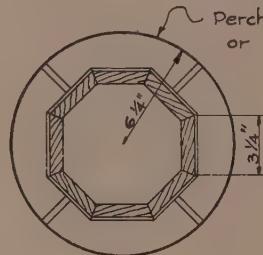


ELEVATION

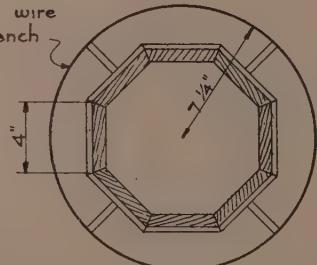
Top and bottom  
put on with  
screws for  
cleaning



VERTICAL SECTION



PLAN OF LOWER ROOM



PLAN OF UPPER ROOM

PLATE XIII

Scale  $3/32" = 1"$

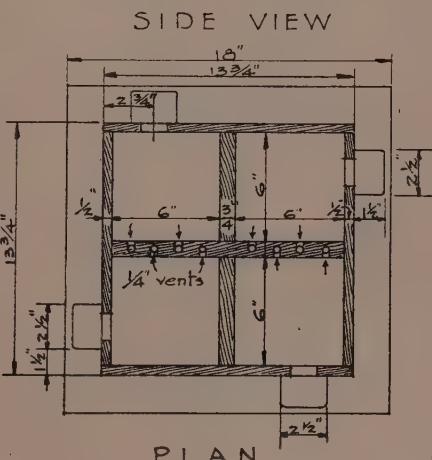


## THE COTTAGE

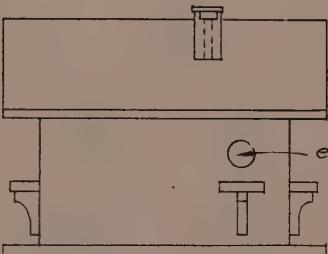
FOUR ROOM BLUE BIRD HOUSE

### BILL OF MATERIAL

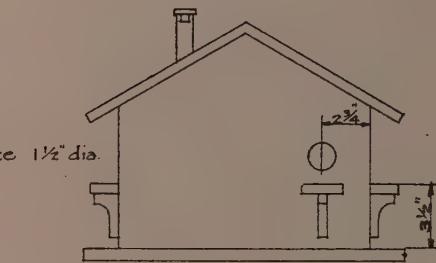
1 PC	34" x 18" x 18"	BOTTOM
2 PC	1/2" x 12 3/4" x 6"	SIDES
2 PC	1/2" x 13 3/4" x 12"	ENDS
1 PC	34" x 7 1/2" x 12 3/4"	PARTITION
2 PC	34" x 7 1/2" x 6"	"
1 PC	1/2" x 12 3/4" x 12 3/4"	CEILING
2 PC	1/2" x 10" x 18"	ROOF
1 PC	1" x 1 1/2" x 2 1/2"	CHIMNEY
1 PC	1/4" x 1 1/4" x 13 1/4"	" CAP
4 PC	1/2" x 1 1/2" x 2 1/2"	PERCH
4 PC	1/2" x 1 1/4" x 2 1/2"	BRACKETS
1 PAIR	HINGES	"
1 HOOK		



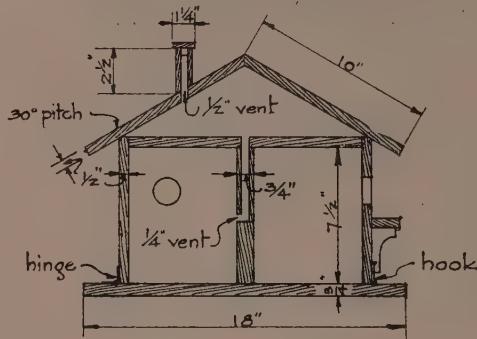
PLAN



SIDE VIEW



FRONT VIEW



SECTION

Note: Bottom hinged for cleaning

Scale 3 3/2" = 1"

PLATE XIV

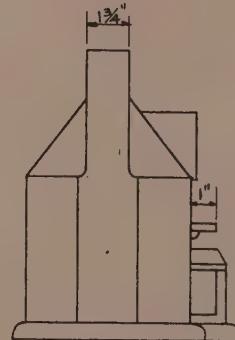


### ENGLISH COTTAGE

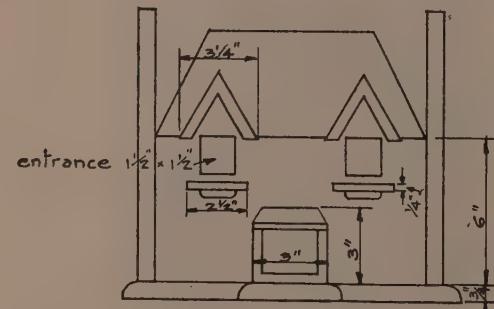
#### 2 ROOM BLUEBIRD HOUSE

##### BILL OF MATERIAL

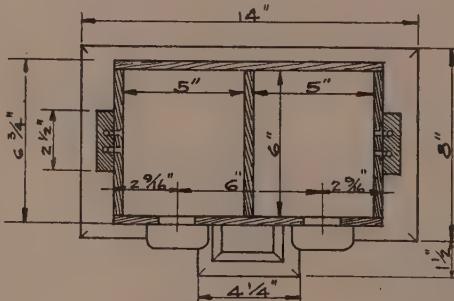
1 PC	$3\frac{1}{4}'' \times 8'' \times 14''$	BOTTOM
1 PC	$3\frac{1}{4}'' \times 1\frac{1}{2}'' \times 4\frac{1}{4}''$	PORCH FLOOR
1 PC	$3\frac{1}{4}'' \times 1\frac{1}{8}'' \times 6''$	BACK
1 PC	$3\frac{1}{4}'' \times 1\frac{1}{8}'' \times 7\frac{3}{4}''$	FRONT
2 PC	$3\frac{1}{4}'' \times 6'' \times 6''$	ENDS
1 PC	$3\frac{1}{4}'' \times 6'' \times 10''$	PARTITIONS
2 PC	$3\frac{1}{4}'' \times 1\frac{1}{8}'' \times 5\frac{1}{2}''$	ROOF
2 PC	$3\frac{1}{4}'' \times 6'' \times 4\frac{3}{8}''$	"
1 PC	$3\frac{1}{4}'' \times 1\frac{1}{2}'' \times 3''$	PORCH
2 PC	$3\frac{1}{4}'' \times 3\frac{1}{8}'' \times 2''$	" COLUMN
1 PC	$3\frac{1}{4}'' \times 1\frac{1}{2}'' \times 3''$	" ROOF
2 PC	$\frac{1}{4}'' \times 2\frac{1}{2}'' \times 1''$	PERCH
2 PC	$\frac{1}{4}'' \times 2\frac{1}{2}'' \times 11\frac{1}{4}''$	CHIMNEYS
2 PC	$\frac{1}{4}'' \times 1\frac{1}{2}'' \times 14''$	PERCH
1 PAIR	HINGES	
1	HOOK	



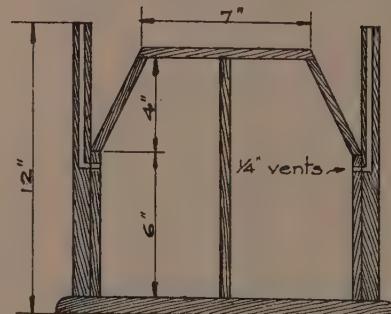
SIDE VIEW



FRONT VIEW



PLAN



SECTION

Notes: Bottom hinged for cleaning.  
Chimneys & corners painted  
to represent stonework.

Scale  $1/8'' = 1''$

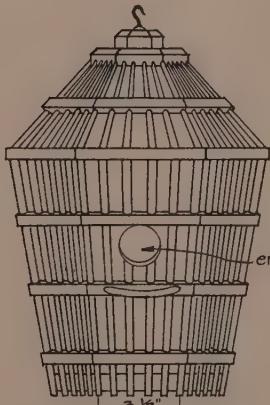
PLATE XV



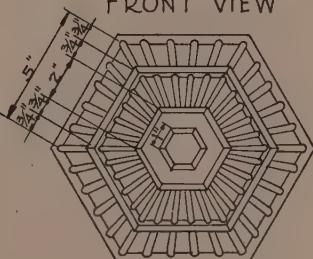
JAPANESE BLUEBIRD  
THIS HOUSE WON SECOND  
PRIZE IN A BIRDHOUSE CONTEST

BILL OF MATERIAL

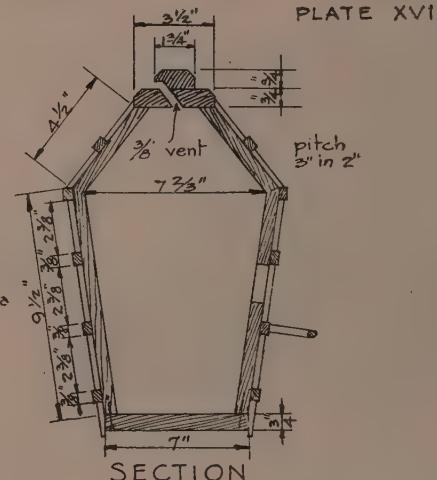
6 PC $1/2" \times 5"$ to $3\frac{1}{2}'' \times 9\frac{1}{2}''$	SIDES
6 PC $1/2" \times 5"$ to $2" \times 4\frac{1}{2}''$	"
1 PC $3\frac{1}{4}'' \times 4"$ HEXAGON TOP	
1 PC $3\frac{1}{4}'' \times 2"$	"
1 PC $3\frac{1}{4}'' \times 7"$	BOTTOM
130" $1/4" \times 3/8"$	STRIP
360" HALF ROUND	"
1 PC 7" BENT TWIG	PERCH
1 HOOK	



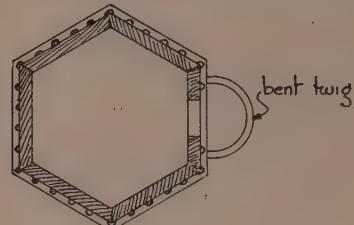
FRONT VIEW



TOP VIEW



SECTION



PLAN

Note: Bottom comes off for cleaning

Scale  $1/8" = 1"$

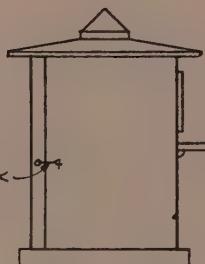


## OBSERVATION BLUE BIRD. HOUSE

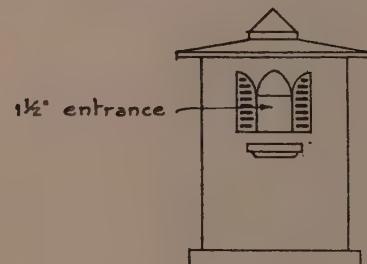
### BILL OF MATERIAL

1 PC	36" x 7" x 7"	BOTTOM
2 PC	1/2" x 6" x 8"	FRONT & BACK
2 PC	1/2" x 5" x 8"	SIDES
1 PC	3/4" x 8" x 8"	TOP
1 PC	1 1/2" x 2" x 2"	CAP
1 PC	1/4" x 1 1/2" x 2 1/4"	PERCH
1 PC	1/4" x 1 3/4"	"
2 PC	1/4" x 3 1/4" x 2 1/2"	SHUTTERS
1 PC	5 1/4" x 6"	GLASS
1 PAIR	HINGES	
1 HOOK	& EYE	

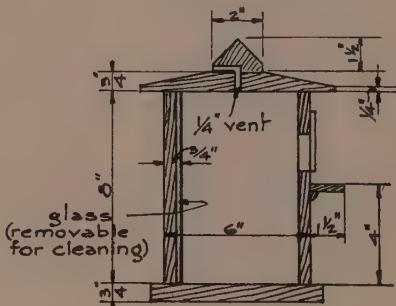
## PLATE XVII



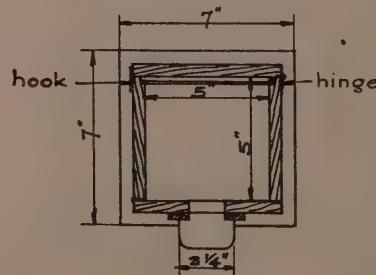
SIDE VIEW



FRONT VIEW



SECTION



PLAN

Back hinged for cleaning.

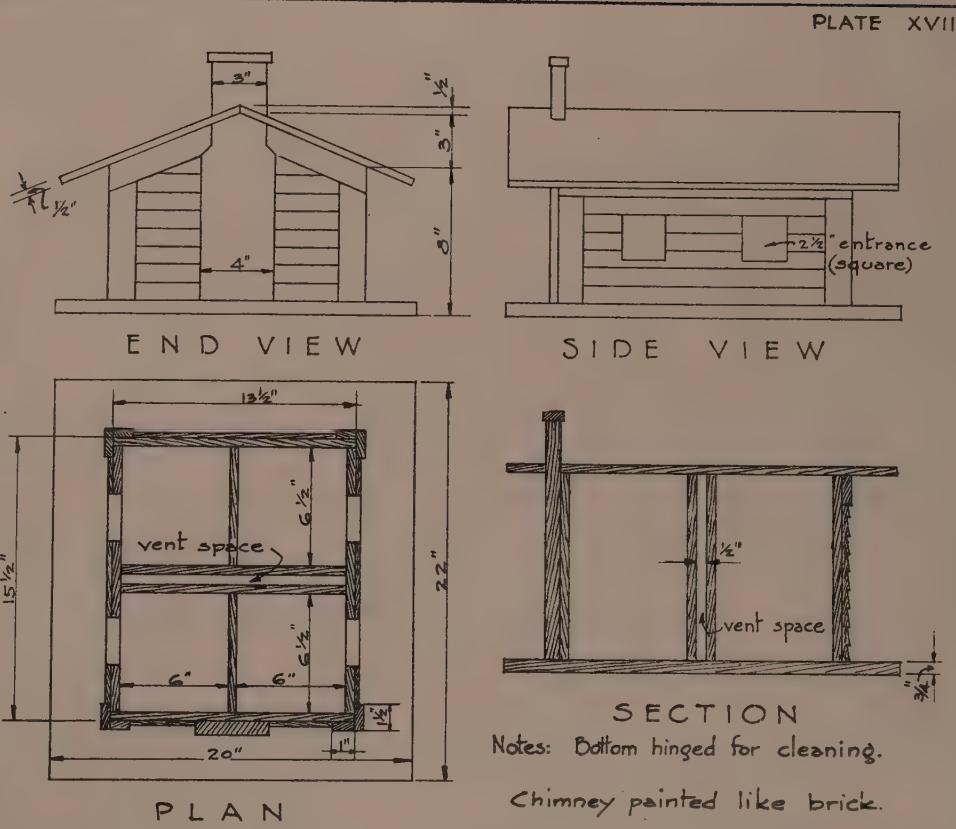
Scale  $1/8" = 1'-0"$

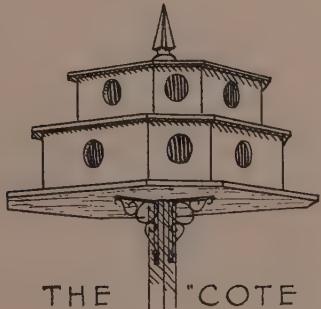


### THE CABIN

4 ROOM MARTIN HOUSE  
 THIS HOUSE WON FIRST PRIZE  
 IN A BIRD HOUSE CONTEST  
 BILL OF MATERIAL

1 PC	$3/4" \times 20" \times 22"$	BOTTOM
2 PC	$1/2" \times 12 \frac{1}{2}" \times 10 \frac{1}{4}"$	ENDS
2 PC	$1/2" \times 14 \frac{1}{2}" \times 7 \frac{1}{4}"$	SIDES
2 PC	$1/2" \times 12 \frac{1}{2}" \times 10 \frac{1}{4}"$	PARTITIONS
2 PC	$1/2" \times 6 \frac{1}{2}" \times 10 \frac{1}{4}"$	"
2 PC	$1/2" \times 10 \frac{1}{2}" \times 22$	ROOF
1 PC	$3/4" \times 4" \times 13"$	CHIMNEY
1 PC	$1/2" \times 1" \times 5 \frac{1}{4}"$	" CAP
4 PC	$1/2" \times 1" \times 6"$	CORNER BOARD
4 PC	$1/2" \times 1 \frac{1}{2}" \times 6"$	" "
62"	$1/2" \times 1 \frac{1}{2}"$	FRIEZE
220"	$1/2" \times 1"$	DEVEL SIDING



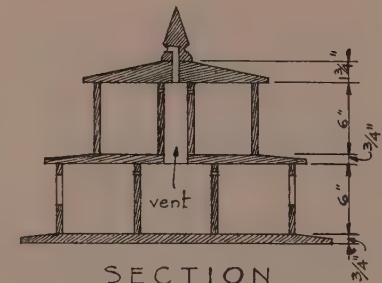


THE "COTE"

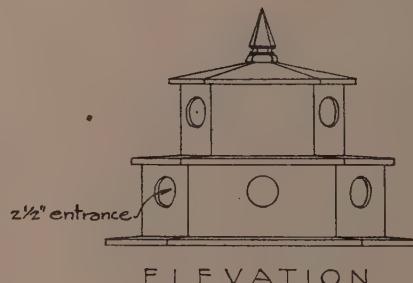
12 ROOM MARTIN HOUSE

## BILL OF MATERIAL

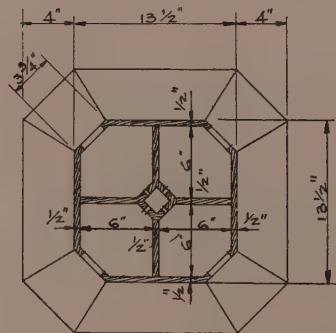
1 PC	$3\frac{1}{4}'' \times 26'' \times 26''$	BOTTOM
4 PC	$\frac{1}{2}'' \times 6'' \times 12\frac{1}{2}''$	SIDES
4 PC	$\frac{1}{2}'' \times 6'' \times 5\frac{1}{2}''$	"
2 PC	$\frac{1}{2}'' \times 6'' \times 19''$	PARTITIONS
6 PC	$\frac{1}{2}'' \times 6'' \times 6''$	"
1 PC	$3\frac{1}{4}'' \times 21\frac{1}{2}'' \times 21\frac{1}{2}''$	2 <sup>nd</sup> FLOOR
4 PC	$\frac{1}{2}'' \times 8\frac{1}{4}'' \times 6''$	SIDES
4 PC	$\frac{1}{2}'' \times 3\frac{3}{4}'' \times 6''$	"
4 PC	$\frac{1}{2}'' \times 4\frac{1}{2}'' \times 6''$	PARTITIONS
4 PC	$\frac{1}{2}'' \times 2'' \times 6''$	VENT FLUE
1 PC	$13\frac{1}{4}'' \times 15\frac{1}{2}'' \times 15\frac{1}{2}''$	TOP
1		FINIAL



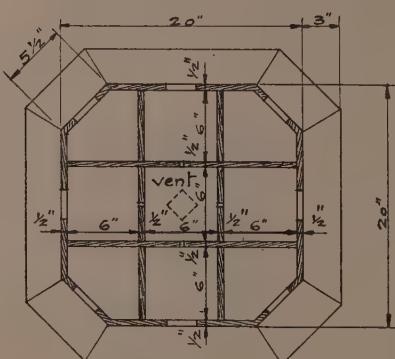
SECTION



ELEVATION

2<sup>ND</sup> FLOOR PLAN

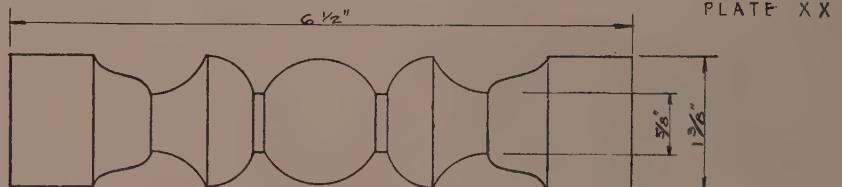
Note: Cleaned by hinge plan

1<sup>ST</sup> FLOOR PLANScale  $\frac{1}{16}'' = 1''$

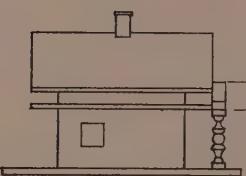


THE PLAZA  
18 ROOM MARTIN HOUSE

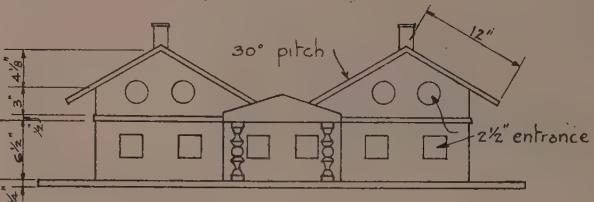
BILL OF MATERIAL	
1 PC	$3\frac{1}{2}'' \times 26\frac{1}{2}'' \times 54''$ BOTTOM
2 PC	$1\frac{1}{2}'' \times 6\frac{1}{2}'' \times 14''$ SIDES
2 PC	$1\frac{1}{2}'' \times 6\frac{1}{2}'' \times 13\frac{1}{2}''$ "
2 PC	$1\frac{1}{2}'' \times 6\frac{1}{2}'' \times 13''$ "
2 PC	$1\frac{1}{2}'' \times 6\frac{1}{2}'' \times 13\frac{1}{4}''$ "
2 PC	$1\frac{1}{2}'' \times 13\frac{1}{4}'' \times 13''$ DRAWER BOTTOM
1 PC	$1\frac{1}{2}'' \times 6\frac{1}{4}'' \times 13''$ "
2 PC	$1\frac{1}{2}'' \times 6'' \times 13\frac{1}{4}''$ PARTITIONS
5 PC	$1\frac{1}{2}'' \times 6'' \times 6\frac{1}{2}''$ "
1 PC	$1\frac{1}{2}'' \times 20'' \times 42''$ 2ND FLOOR
2 PC	$1\frac{1}{2}'' \times 3'' \times 14''$ SIDES
4 PC	$1\frac{1}{2}'' \times 7'' \times 18''$ "
2 PC	$1\frac{1}{2}'' \times 12'' \times 20''$ ROOF
2 PC	$1\frac{1}{2}'' \times 16'' \times 20''$ "
2 PC	$1\frac{1}{2}'' \times 7'' \times 16''$ PARTITIONS
2 PC	$1\frac{1}{2}'' \times 6'' \times 6\frac{1}{4}''$ "
2 PC	$1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 3''$ CHIMNEY
1 PC	$1\frac{1}{2}'' \times 3'' \times 13''$ PORCH
2	$6\frac{1}{2}''$ COLUMNS



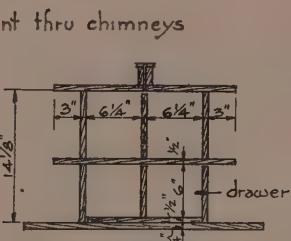
HALF SIZE DETAIL OF COLUMN



SIDE VIEW

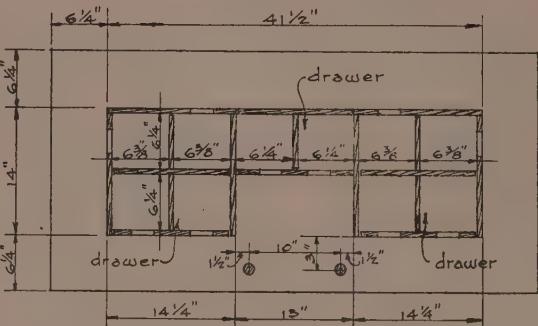


FRONT VIEW



SECTION

Note Remove roof for  
cleaning attic.



PLAN

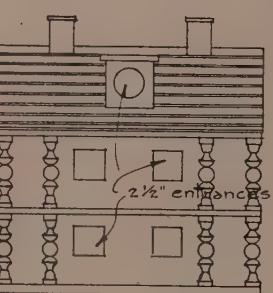
Scale  $3\frac{1}{2}'' = 1''$



THE COLONIAL  
11-ROOM MARTIN HOUSE

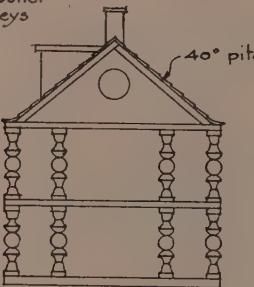
BILL OF MATERIAL

1 PC	$3/4" \times 18" \times 22"$	BOTTOM
2 PC	$1/2" \times 18" \times 22"$	FLOORS
4 PC	$1/2" \times 13\frac{1}{2}'' \times 6"$	SIDES
4 PC	$1/2" \times 8\frac{1}{2}'' \times 6"$	ENDS
2 PC	$1/2" \times 12\frac{1}{2}'' \times 6"$	PARTITIONS
2 PC	$1/2" \times 4" \times 6"$	"
2 PC	$1/2" \times 22" \times 11"$	ROOF
4 PC	$1/2" \times 15" \times 6\frac{1}{2}''$	ATTIC PARTITIONS
1 PC	$1/2" \times 4" \times 4"$	DORMER FRONT
2 PC	$1/2" \times 4" \times 4"$	" SIDES
2 PC	$1\frac{1}{2}'' \times 2" \times 3"$	CHIMNEY
2 PC	$1/4" \times 13\frac{1}{4}'' \times 2\frac{1}{4}''$	" CAP
16	6"	COLUMNS

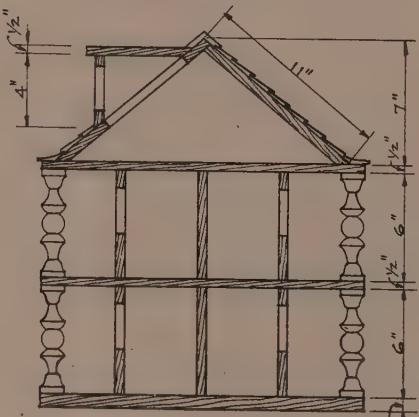


FRONT VIEW

ventilation outlet  
thru chimneys



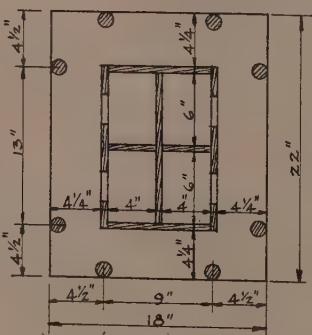
SIDE VIEW  
scale  $1/6"=1"$



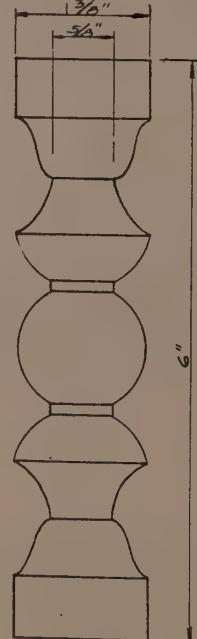
SECTION  
Scale -  $3/32"=1"$

Note: Cleaned by sections

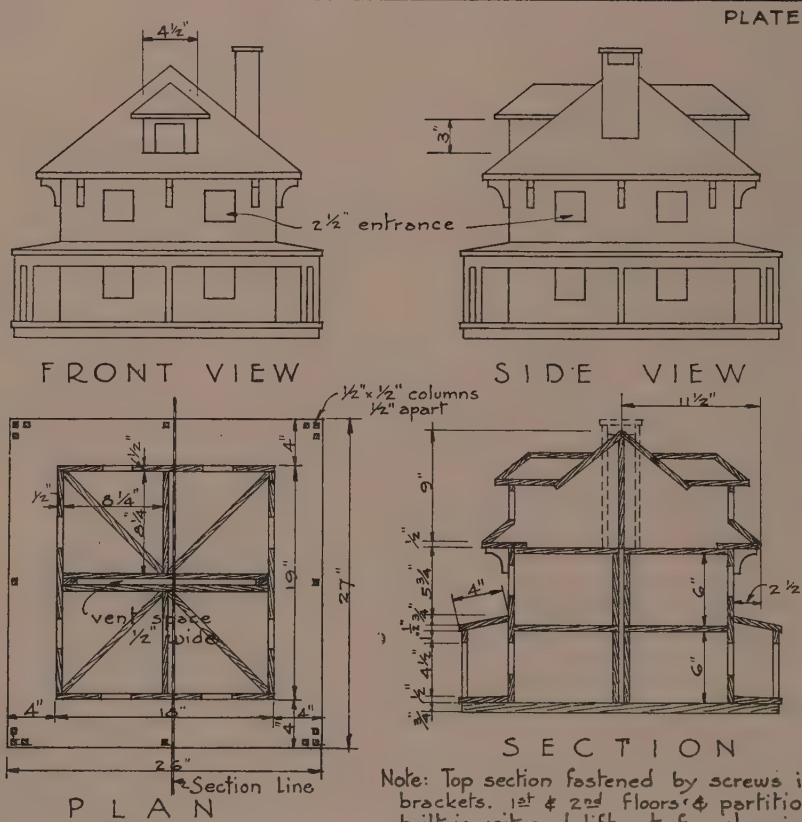
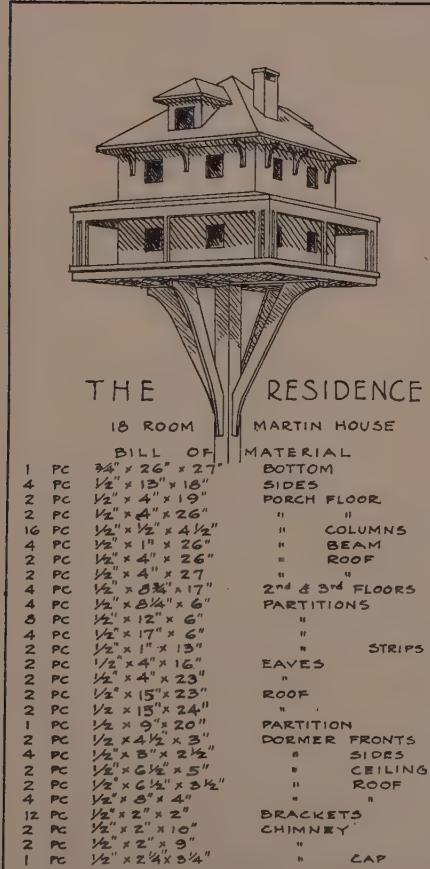
PLATE XXI

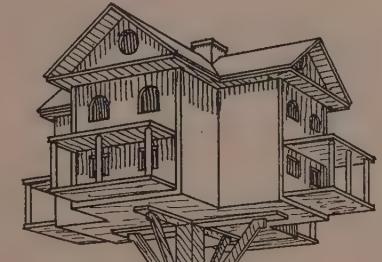


PLAN  
scale  $1/6"=1"$



HALF SIZE  
DETAIL OF  
COLUMN



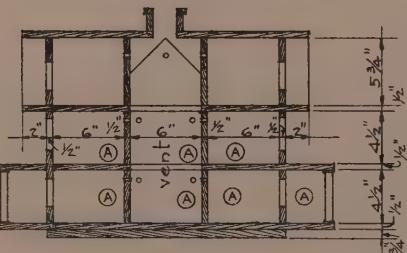


THE MANSION  
20 ROOM MARTIN HOUSE

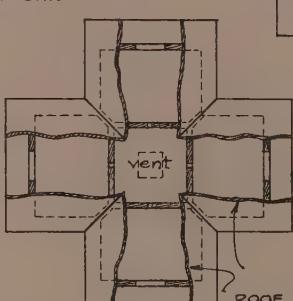
BILL OF MATERIAL

1 PC	$3\frac{1}{2}'' \times 9\frac{1}{2}'' \times 20''$	BOTTOM
2 PC	$\frac{3}{4}'' \times 9\frac{1}{2}'' \times 5\frac{1}{4}''$	"
1 PC	$\frac{1}{2}'' \times 8\frac{1}{2}'' \times 23\frac{1}{2}''$	DRAWER BOTTOM
1 PC	$\frac{1}{2}'' \times 8\frac{1}{2}'' \times 23\frac{1}{2}''$	2ND FLOOR
	$6\frac{1}{2}'' \times 6''$ VENT THRU	
6 PC	$\frac{1}{2}'' \times 8\frac{1}{2}'' \times 4\frac{1}{2}''$	PARTITION
4 PC	$\frac{1}{2}'' \times 6'' \times 4\frac{1}{2}''$	"
1 PC	$\frac{1}{2}'' \times 4\frac{1}{2}'' \times 8\frac{1}{2}''$	PORCH FLOOR
1 PC	$\frac{1}{2}'' \times 4'' \times 8\frac{1}{2}''$	" ROOF
4 PC	$\frac{1}{2}'' \times 8\frac{1}{2}'' \times 9\frac{1}{4}''$	DRAWER FLOORS
4 PC	$\frac{1}{2}'' \times 8\frac{1}{2}'' \times 4\frac{1}{2}''$	" FRONTS
4 PC	$\frac{1}{2}'' \times 4\frac{3}{4}'' \times 4\frac{1}{2}''$	PARTITIONS
1 PC	$\frac{1}{2}'' \times 11\frac{1}{2}'' \times 24''$	ATTIC FLOOR
2 PC	$\frac{1}{2}'' \times 11\frac{1}{2}'' \times 6\frac{1}{4}''$	" "
8 PC	$\frac{1}{2}'' \times 12'' \times 8\frac{1}{2}''$	ROOF
4 PC	$\frac{1}{2}'' \times 11'' \times 5\frac{1}{2}''$	GABLE
4 PC	$\frac{1}{2}'' \times 7'' \times 5\frac{1}{2}''$	PARTITION
2 PC	$\frac{1}{2}'' \times 2'' \times 3''$	CHIMNEY
2 PC	$\frac{1}{2}'' \times 3'' \times 3''$	"
12 PC	$\frac{3}{8}'' \times 4\frac{1}{2}''$	COLUMNS

spaces marked (A)  
are built into one  
drawer unit



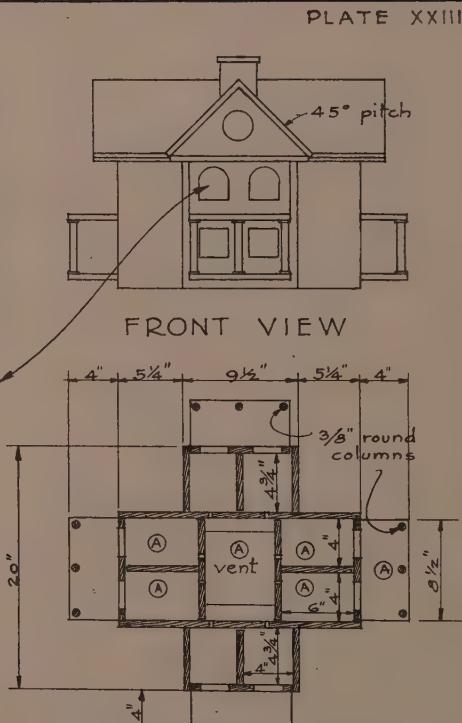
SECTION



ROOF BROKEN  
AWAY TO SHOW  
ATTIC ROOMS

ATTIC PLAN

Note. Cleaned by drawer plan  
Attic by section.



PLAN

Scale  $\frac{1}{16}'' = 1''$

PLATE XXIII

PLATE XXIV

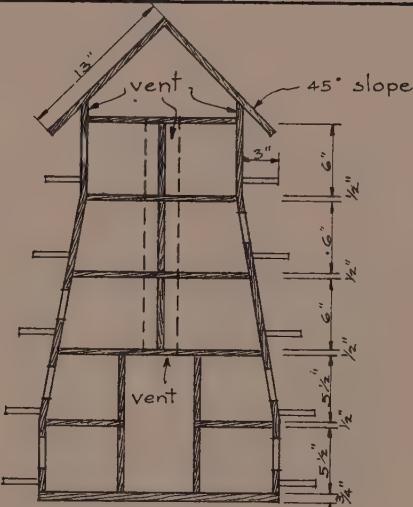


# THE TOWER

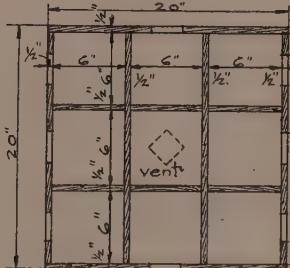
TOWER

MARTIN HO

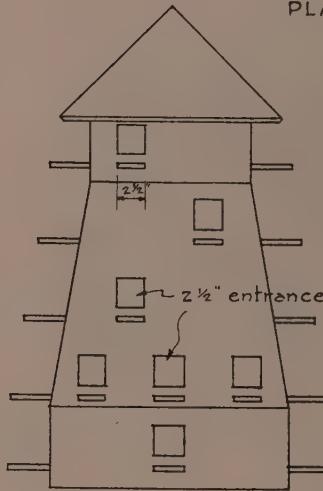
BILL OF MATERIAL	
1 PC	3/4" x 20" x 20"
2 PC	1/2" x 6" x 19"
2 PC	1/2" x 6" x 20"
2 PC	1/2" x 19" x 12 1/2" x 10"
2 PC	1/2" x 20" x 13 1/2" x 10"
2 PC	1/2" x 12 1/2" x 7 1/2"
2 PC	1/2" x 13 1/2" x 7 1/2"
2 PC	1/2" x 6 1/2" x 19"
2 PC	1/2" x 6" x 6 1/2"
1 PC	1/2" x 17" x 17"
1 PC	1/2" x 14 1/2" x 14 1/2"
2 PC	1/2" x 12 1/2" x 12 1/2"
4 PC	1/2" x 19" x 5 1/2"
12 PC	1/2" x 6" x 5 1/2"
4 PC	1/2" x 7" x 6"
4 PC	1/2" x 6" x 6"
4 PC	1/2" x 6" x 5"
4 PC	1/2" x 2" x 20"
4 PC	1/2" x 18" x 13"
2A PC	3/4" x 2 1/2" x 3"
FLOORS	
PARTITIONS	
VENT FLUE	
ROOF	
PERCHES	



## SECTION

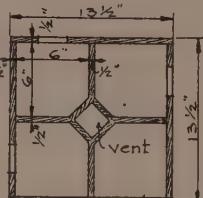


PLAN - 1<sup>ST</sup> FLOOR



## ELEVATION

Note: Floors, partitions & bottom are built in one unit. Side walls & roof are built in one unit, and lift off for cleaning. Units are fastened together by screws thru bottom into sides. P



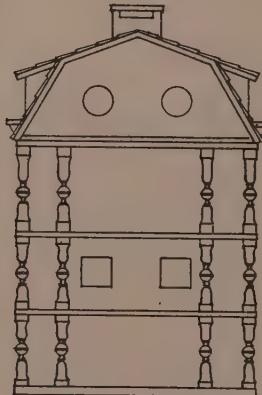
PLAN TOP FLOOR

Scale  $\frac{1}{16}$ " = 1"

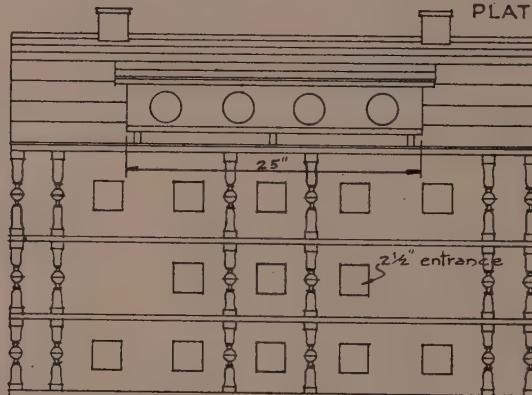


### THE HAWKEYE

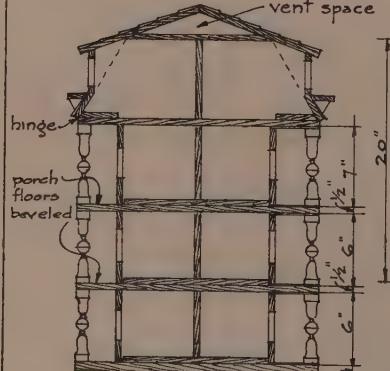
1	PC	34" x 20" x 43 1/2"	42 ROOM MARTIN HOUSE
9	PC	1/2" x 20" x 43 1/2"	BOTTOM FLOORS
3	PC	1/2" x 12" x 32 1/2"	DRAWER BOTTOM ENDS
4	PC	1/2" x 6" x 13"	"
2	PC	1/2" x 7" x 13"	SIDES
4	PC	1/2" x 6" x 33 1/2"	"
2	PC	1/2" x 7" x 33 1/2"	PARTITIONS
4	PC	1/2" x 5" x 12"	vent space
4	PC	1/2" x 6" x 12"	UPPER DORMER
10	PC	1/2" x 6" x 12"	" FRONTS
5	PC	1/2" x 6" x 6 1/2"	" ENDS
2	PC	1/2" x 3 1/2" x 6 1/2"	GABLE
2	PC	1/2" x 6" x 20"	CEILING
2	PC	1/2" x 6" x 43 1/2"	PARTITION
2	PC	1/2" x 7" x 43 1/2"	DORMER PERCH
2	PC	1/2" x 4" x 26"	CHIMNEY
2	PC	1/2" x 3 1/2" x 25"	"
4	PC	1/2" x 27" x 3"	STRAP IRON
2	PC	1/2" x 8 1/2" x 19"	SHINGLES
2	PC	1/2" x 12" x 33 1/2"	
1	PC	1/2" x 6" x 33 1/2"	
10	PC	1/2" x 6" x 6 1/2"	
2	PC	1/2" x 2" x 25"	
4	PC	1/2" x 2" x 2 1/2"	
4	PC	1/2" x 1 1/2" x 3"	
2	PC	1/2" x 24" x 4 1/4"	
12	PC	1/8" x 1/2" x 6"	
24	"	6" SPINDLES	
12	"	7"	
1	PIANO HINGE		
20		3" x 43 1/2"	



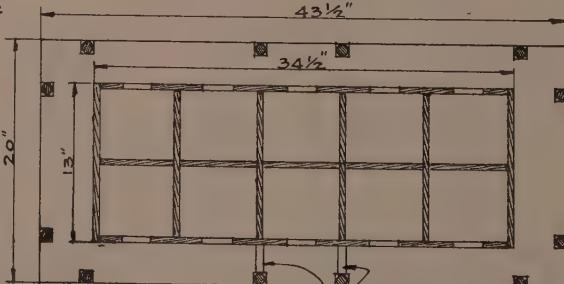
SIDE VIEW



FRONT VIEW



SECTION



posts attached to drawers with strap irons

Notes. 1st 2nd & 3rd floors clean by drawers. Top hinged  
Ventilation outlet thro. Chimneys  
This House won second prize in a Bird House Contest  
Scale  $1/6" = 1'$

PLATE XXVa

room, ventilation can be furnished by boring a few holes in the sides of the house under the eaves. Never have a ventilating hole lower than the entrance.

In a large house of two or more rooms, the partition can be constructed with an air chamber between the inside walls. An air outlet should be made in the gable. If the house has a chimney, air can pass through a hole bored in its side. A large martin house with several rooms may be ventilated in the following manner. The inside walls should be constructed of  $\frac{3}{4}$ " material with at least five holes  $\frac{3}{8}$ " in diameter bored through each inside wall, through the partition. The upper story should have holes bored in the same place making the holes continuous in the inside walls. This would provide an air chamber between each room. Holes should be bored in the side of the wall five inches from the floor, and should meet the ones bored perpendicularly in the walls. The air will be carried to the top of the room and taken up through the wall to the top of the house to the outlet. Every floor can thus be ventilated. Boring holes is much easier than making a

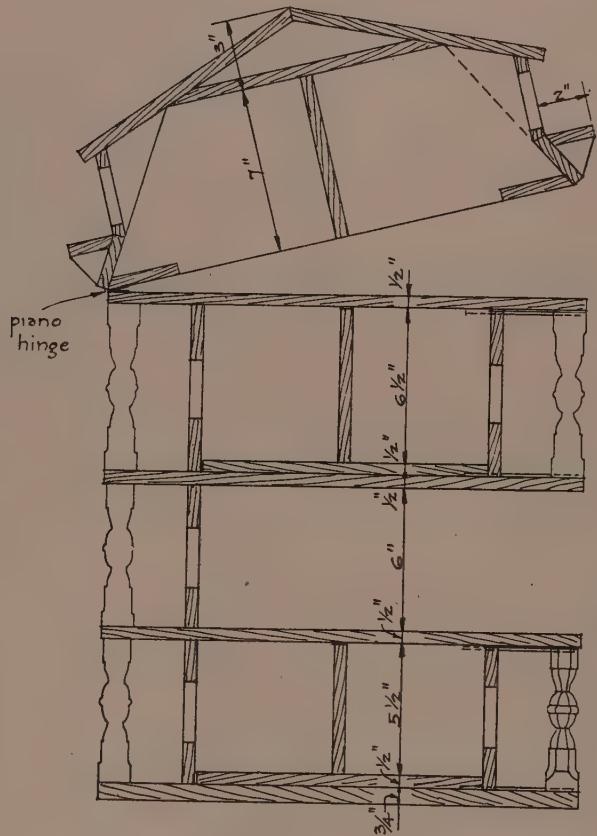
partition between each wall. A house properly ventilated is cooler than one with no ventilation.

In summer the inside of many houses gets so warm that the young birds die from the heat. A bird house placed in the shade would be more healthful and cooler than one placed in the sun.

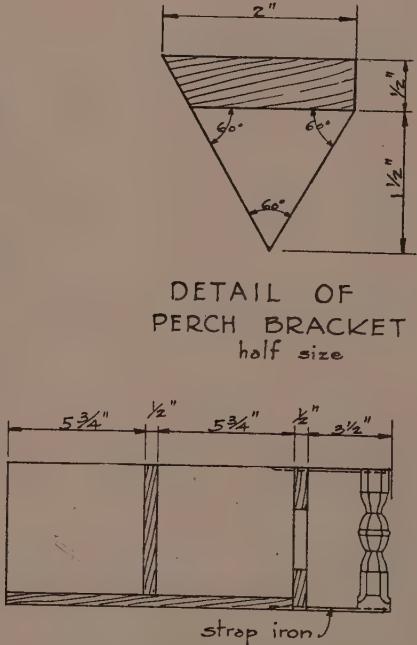
Some types of houses cannot well be placed in the shade. The martin house, for instance, should be situated in the open, away from trees, as this location is more suitable to the sailing habits of the birds. A large martin house, sheltering eight pairs of birds, needs ventilation. Sixteen parent birds, not considering the young, would foul the air in the rooms, consequently we recommend ventilation to keep the house healthful and make it cooler during the hot summer days.

#### OBSERVATION HOUSES FOR NATURE STUDENTS

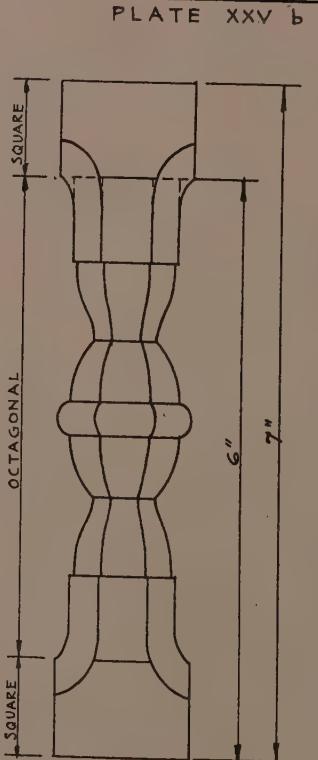
An observation house is constructed to enable the naturalist to watch the development of eggs and young birds. Very valuable data can be gathered in this way. The house has a door on hinges. When this is opened the nest and its contents are visible



SECTION scale  $1/8"=1'$   
SHOWING ONE DRAWER  
REMOVED AND ATTIC  
RAISED FOR CLEANING



DETAIL OF  
PERCH BRACKET  
half size



DETAIL OF  
COLUMN  
half size

through the plate of glass which now acts as a side to the house. Plates X and XVII show designs for observation houses.

### NATURAL WOOD BOXES

Fig. 3 gives a good idea of possibilities in the use of hollow limbs, and snags in general, in building effective bird houses.

After every wind storm, numbers of hollow limbs are found about the lawns and streets. These may be sawed into proper lengths. Well towards the top, a hole should be chiseled and then filed smooth. Next, the stump should be set on paper, and reaching through the top cavity with a pencil, an outline of the lower interior of the cavity should be sketched. With a scroll a perfect plug to fit this lower end can be cut out of half inch lumber. The exterior outline can then be drawn, and after nailing the plug to this thicker wooden base, the two will fit the bottom of the log perfectly and should be nailed there. A similar operation will complete the top. The houses can be topped with roofing material over the wooden plug.

As illustrated in No. 2, snags can easily be fit over a four or six-sided box. Nos. 4 and 5 are snags which are ready for such placement. The large snag should



FIG. 3—NATURAL WOOD BOXES

be placed in a box similar but larger than the second box in the illustration. Screech owls would probably take possession.

Box No. 1, at the left, harbored black-capped chickadees and bluebirds for three years while it was four feet from the ground. Upon placing it twelve feet up, it became the home of tufted titmice. No. 2, when placed on top of a clothes line post, captured house wrens and bluebirds. No. 3 harbored bluebirds and wrens while located on a pole, but later, when placed ten feet up on the side of a chestnut tree, it attracted red-headed woodpeckers. No. 6 was the home of great-crested flycatchers for four years.

#### MARTIN HOUSE

The martin house, shown in Fig. 4, has given forty years of service, and is good for several years more. When building a bird house one should have permanency in mind, so that the box will last for at least forty years. It can be done by following these instructions, and the finished product will be well worth the time and trouble.

Think of the great benefit the generations of martins have derived from this old house. The builder himself had no idea of the good he was rendering. The birds have returned year after year to raise their broods and in the period of forty years



FIG. 4—MARTIN HOUSE WHICH HAS GIVEN FORTY YEARS OF SERVICE

hundreds of martins have been reared in this house. They have returned each year and any vacant room was quickly filled by young birds who had followed their parents. A great many changes took place during that long time. The bird home builder is gone, others have come to enjoy the presence of the martins which live in the old house which has stood the storms of forty winters and summers.

During these many years the people of the community have been greatly benefited by the erection of this house. The birds, during this time, have destroyed countless millions of insects, and have been a source of pleasure because of their circling flight and warbling song.

The builder of this house deserves recognition as he has been of service to humanity, not only from an economic standpoint, but from the aesthetic as well. Others, realizing the value of the martins and the pleasure from having the birds, have followed the worthy example of the builder and have constructed similar houses. The house has twenty-eight rooms, and is large enough to accommodate fifty-six birds.

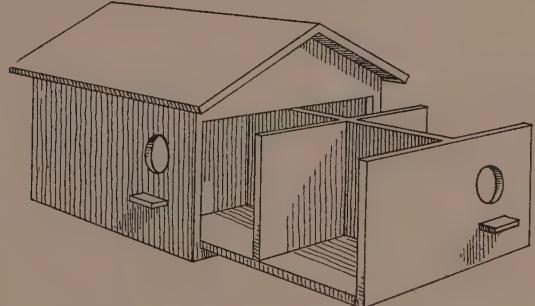
It is attached to an old worm eaten pole which shows it has stood the test of time. It is a living monument to the man who made it, and stands as a far better monument than a marble slab.

A school yard, whether a town or country school, would be an appropriate place for the location of a martin house, as the presence of the birds would be of interest to the children, teaching them to love and respect wild life. A college campus with several martin houses properly placed about the premises would look more beautiful.

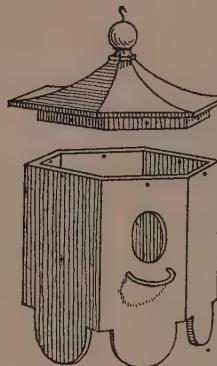
People in large cities rarely see many birds. As martins readily adapt themselves to city conditions, the people would become acquainted with them if martin houses were placed in city parks. What could be more fitting in a cemetery than several martin houses, where the birds would fill the quietness of the place with their sweet music? Birds and flowers make a good combination. A martin house located near a hospital is always of great interest to the patients. It would help them pass the many weary hours and keep their minds from their own troubles.

## CLEANING PLANS

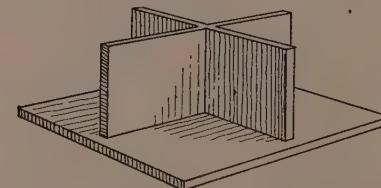
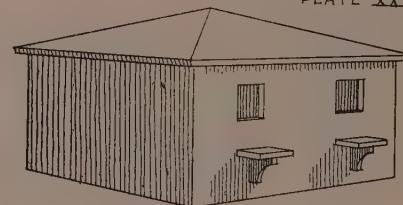
PLATE XXVI



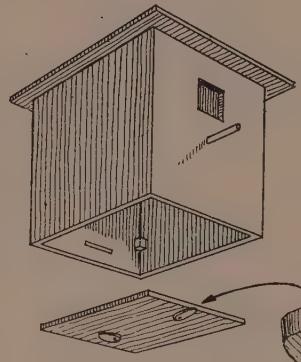
DRAWER PLAN



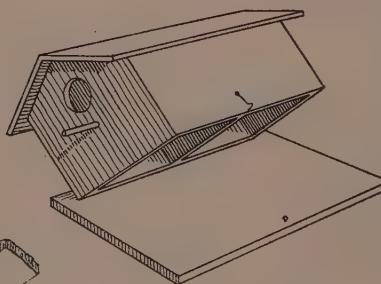
REMOVABLE TOP



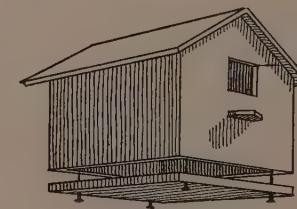
SECTION PLAN



BUTTON PLAN



HINGE PLAN



SCREW PLAN

Each farm should have one or more martin houses to help protect the crops from insects. In the South, the natives place tall poles with cross bars, from which hang gourds. Martins nest in these, and the natives say they keep marauding hawks from the plantations.

The martins are gregarious and a large number will live under one roof. If you erect an apartment house you should soon have a colony of them. After becoming acquainted with the birds and having them on the premises, you will rejoice at their return in the spring and regret their departure in the fall.

Yearly, most states set aside a day in the spring, called Arbor and Bird Day. Trees are set out on that day, as it is dedicated to that cause and also the study of birds. Each state should not only recommend the planting of trees on that day, but should encourage the erection of bird houses as well.

The food of the swallow is one hundred per cent insect life, consisting of mosquitoes, small beetles, gnats, flies, etc., the greater part of which is taken while the bird is flying. However, some have been

known to alight on the outer branches of trees and shrubs, and eat larva which infest these plants.

"A colony of sixteen pairs of martins was observed by Otto Widmann of Old Orchard, Missouri. The observation was made from 4 a. m. to 8 p. m. During this time, the parents visited their offsprings 3,277 times, averaging 205 times per pair."

At that rate, the ten pairs of birds, which, for forty years, have lived in this house, have fed a brood of four or five young birds for a ten days' period, yearly.

Each brood of four or five birds then would destroy during ten days, at least 2,050 insects. But, as the parent birds often bring several insects at one feeding, it is almost beyond the power of computation to figure the true number of the billions of insects destroyed during the forty years by the hundreds of birds born and raised in this old martin box.

#### CLEANING OF BIRD HOUSES

The proper time to clean out a bird house is in the spring before the birds return from the South. Each house should be so constructed that it can easily

be cleaned. (See Fig. 5 and Plate XXVI.) All litter should be entirely removed, for some birds will not build in a house until it is cleaned of the last



FIG. 5—CLEANING ARRANGEMENTS OF FORTY-TWO ROOM MARTIN HOUSE

year's rubbish: If possible, the house should be so arranged that the sun can shine on the inside while cleaning. The sun is nature's disinfectant and will make the house more healthful. Another advantage of an easy cleaning arrangement is that if the English

sparrows start to build, the material they deposit can easily be removed.

#### DRAWER PLAN

The drawer plan is one of the simplest plans for cleaning of a bird house. The box is built like a drawer with a bottom and front. This drawer does not need a back or sides as the nesting material will stick to the bottom of the drawer. Should a sparrow build in a martin house of this plan, its rubbish can easily be removed as a drawer can be pulled out a short distance making it possible to see the sparrow's nest. Clean out the nest and push the drawer back in place.

It is a difficult task to clean out the average house situated on a high pole, and the nesting material must be pulled through an entrance which is  $2\frac{1}{2}$ " in diameter. By the drawer plan, each drawer can be removed and emptied with ease. Each can be scrubbed on the inside, if necessary, and left in the sun to dry.

#### HINGE PLAN

This is a simple and easy way to clean out a bird house. One end of the house is hinged to the floor,

and the other end is held in place by a hook. A screen door hook is preferable. When the house needs cleaning, the hook is loosened and the house leaned back, allowing space enough to remove old nesting material. This debris can be brushed into a bucket which saves littering the ground. The house can be tilted back until the sun dries the interior. The hinge plan may be applied to any kind of house, large or small. A two-story martin house can also be cleaned in this fashion. The floors should be separated by a platform and each floor cleaned separately. On large houses, strong hinges are necessary.

#### QUICK DETACHABLE PLAN

The detachable bottom plan is for use on small houses, such as those built for wrens or bluebirds. It would not be advisable to use this method on a large house. This principle should be used on a one-room house. When cleaning, expose the bottom and the interior to the sun.

#### SECTION PLAN

In the section plan, the house is made in one section. The sides of the house are screwed to the floor.

By removing the screws, the house lifts up and the partitions can be cleaned. The tower martin house is cleaned in this way. (Plate XXIV.)

#### OTHER CLEANING PLANS

The house can be constructed with removable top. The top is held in place by screws and the house can be cleaned by removing the screws. A similar plan is the removable bottom plan. The bottom is held on with screws.

In the door plan, the front of the box is hinged like a door and is held in place by a hook. The front of some houses are held in place with screws. These methods of cleaning are better if used on small houses.

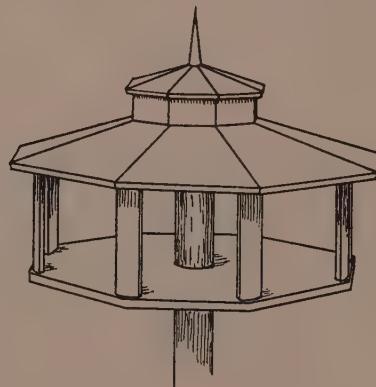
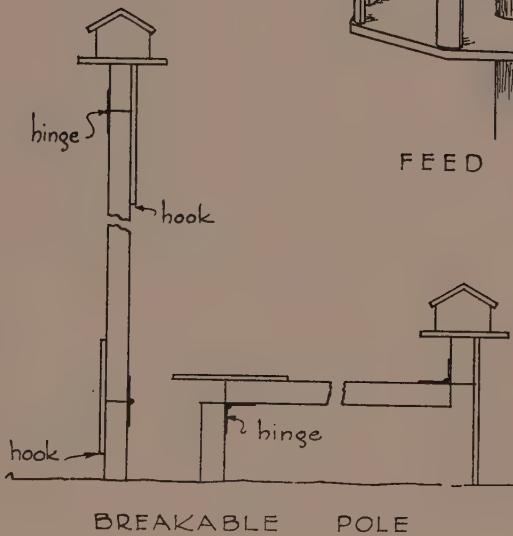
The colonial martin house, Plate XXI, and the residence, Plate XXII, are cleaned in this way. The top story is removable. The partitions are built in one unit and lift out for cleaning. They are made similar to the partitions in an egg case.

#### BREAKABLE POLE FOR BIRD HOUSES

A plan for this pole is shown on Plate XXVII. A pole of this type will simplify the cleaning of the

## BIRD HOUSE ACCESSORIES

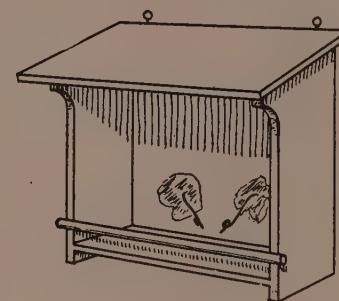
PLATE XXVII



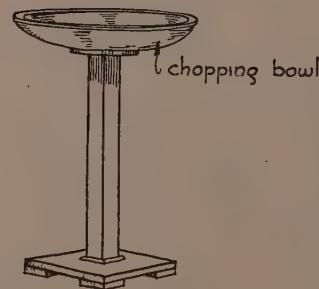
FEED SHELTER



BIRD BATHS



SHELF



chopping bowl

house, and adapts itself particularly to martin and bluebird houses.\*

This type of support has a number of advantages. A pole broken only in one place makes cleaning somewhat difficult, because the sides and end of the house are parallel to the ground. Having the house upright and upon one's own level makes cleaning easy. Likewise, should the house need painting or repairing, it is more easily accomplished on the ground than when working on a ladder, which is dangerous and difficult. A house, placed on a pole of this kind, can be put up quickly and with a small amount of labor by one person. If desirable to remove the house at the close of the season, it can be done in a short time without the aid of a ladder. Another difficulty that is remedied is the problem of occupancy by the English sparrow. This bird sometimes takes possession of a martin house before that bird's return. However, a martin house on such a pole allows the owner to cover the entrance holes with cardboard. Upon the arrival of the martins in the spring, the entrance covers may be removed, and the house is ready for occupancy. This operation re-

quires only a few minutes. Should English sparrows become established, their nests can very quickly be removed. Suggestions for entrance covers for martin houses are shown on Plate XXX.



FIG. 6—FEED SHELTER

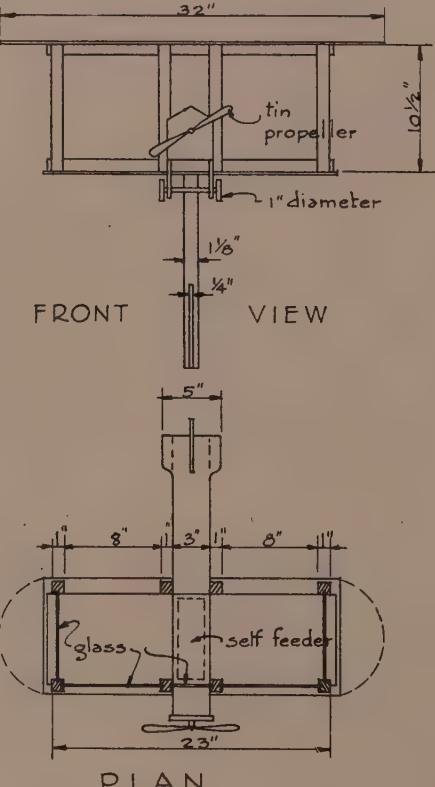
#### AEROPLANE FEEDING SHELTER

This type of feeder is very popular with the winter birds. (Plate XXVIII.) The front and

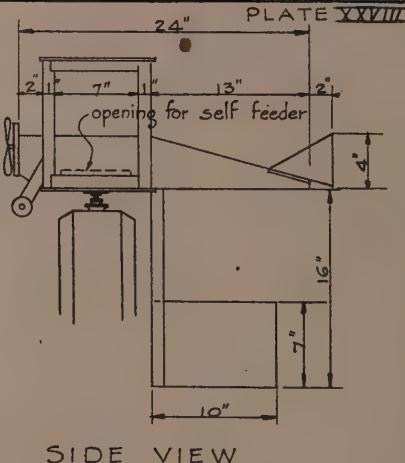


### AEROPLANE FEEDING-SHELTER

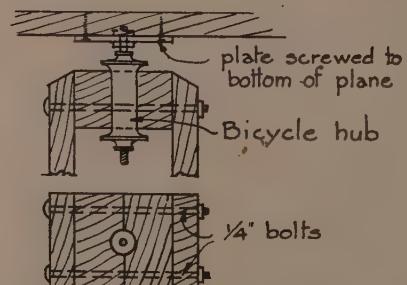
2 PC	1" x 7 3/8" x 24"	WINGS
8 PC	1" x 1" x 10 1/2"	STRUTS
1 PC	1/4" x 9 1/2" x 24 1/2"	LOWER WING
1 PC	1/4" x 9 1/2" x 32	UPPER "
2 PC	1/2" x 4" x 24"	FUSELAGE SIDES
1 PC	1/2" x 2" x 13"	BOTTOM
1 PC	1/2" x 5 1/2" x 13"	TOP
1 PC	1/2" x 4" x 5"	RUDDER
1 PC	1/2" x 3" x 2 1/2"	MOTOR COVER
1 PC	1/2" x 3" x 7 3/8"	SELF FEEDER COVER
1 PC	1/2" x 3 1/2" x 4 1/2"	FRONT FORKS
2 PC	1/4" x 1" x 4 1/2"	AXLE
1 PC	1/4" ROUND X 5"	WHEELS
2 PC	1" DIAMETER	VANE ARM
1 PC	1" x 1 1/8" x 20"	VANE
1 PC	1/8" x 7" x 10"	GLASS
2 PC	7 1/2" x 8 1/2"	"
2 PC	8 1/4" x 10 1/2"	"
1 PC	3 1/4" x 6"	"
1 PC	6" TIN	PROPELLER
1 PC	1/4" x 4" x 4"	METAL PLATE
1 BICYCLE HUB		
2 1/4" BOLTS		
4 1" SCREWS		



Scale 1/16" = 1"



SIDE VIEW



DETAIL OF PIVOT

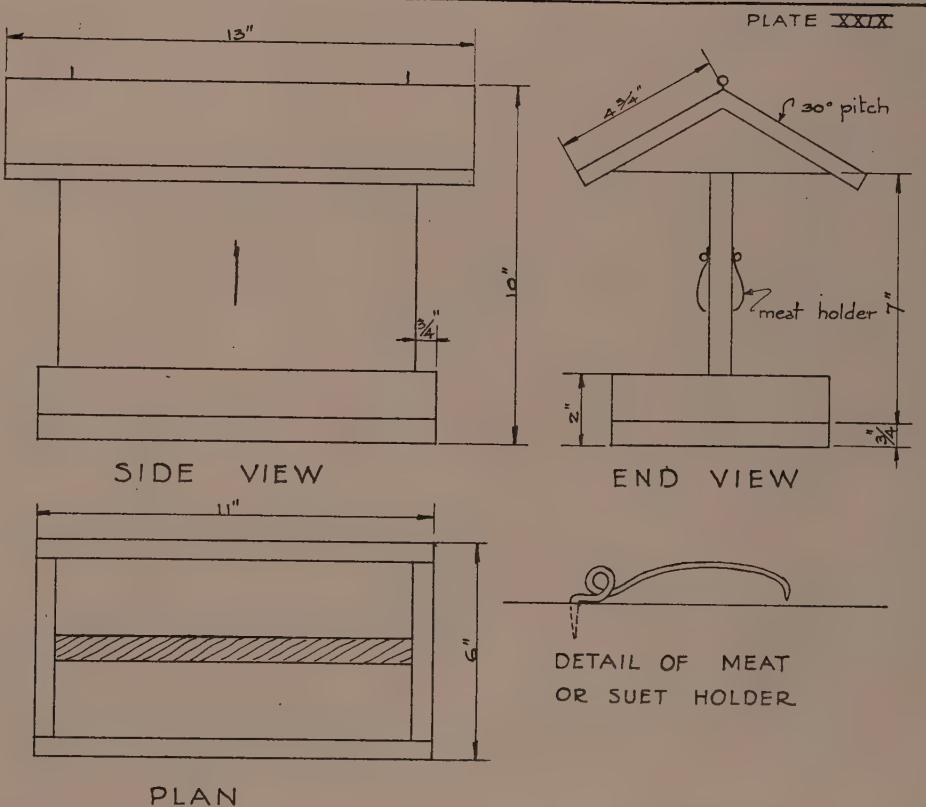
PLATE XXVIII



## "TROLLEY" FEEDER

### BILL OF MATERIAL

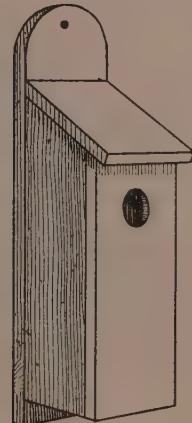
- 1 PC  $3\frac{1}{4}'' \times 6'' \times 11''$  BOTTOM
- 1 PC  $3\frac{1}{4}'' \times 10'' \times 8\frac{1}{2}''$  PARTITION
- 2 PC  $\frac{1}{2}'' \times 1\frac{1}{4}'' \times 11''$  SIDES
- 2 PC  $\frac{1}{2}'' \times 1\frac{1}{4}'' \times 5''$  ENDS
- 2 PC  $\frac{1}{2}'' \times 6'' \times 1\frac{3}{4}''$  GABLES
- 2 PC  $\frac{1}{2}'' \times 4\frac{3}{4}'' \times 13''$  ROOF
- 2 MEAT HOLDERS
- 2 SCREW EYES



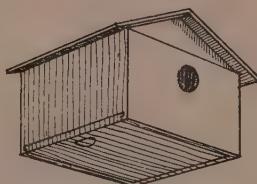
Scale  $3\frac{1}{2}'' = 1''$

## ODDS AND ENDS

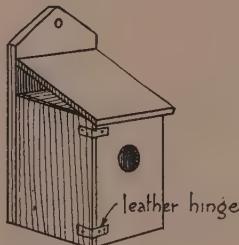
PLATE XXX



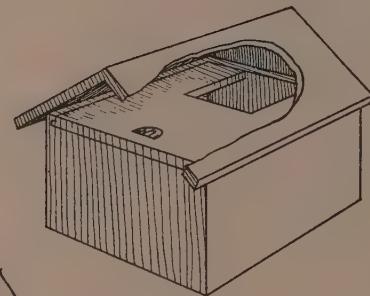
MAIL BOX TYPE



INVERTED CHALK BOX

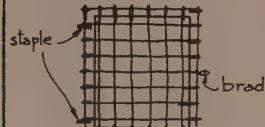


CIGAR BOX



SPARROW TRAP

MADE FROM CHALK BOX



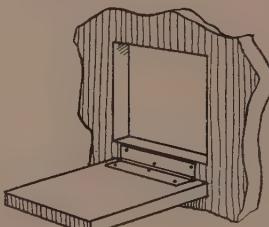
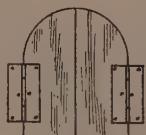
SCREEN



CLOSED

OPEN

SHUTTER

HINGED PERCH  
TO SWING UP  
TO COVER DOOR.

CLOSED



OPEN

SHUTTERS

ARRANGEMENTS TO KEEP OUT SPARROWS ETC. UNTIL BIRDS RETURN

ends are of glass. On windy days, in winter, the birds can feed, protected from the wind. The feeder works like a weather vane and the back of the plane is away from the wind. The bicycle hub works on ball bearings, and a slight change in the direction of the wind causes the plane to move. The self-feeder is an advantage as it can be filled with ground feed and drops the food as it is consumed. Food can also be placed on the floor of the feeder. A forked stick on each side of the feeder holds the suet and makes the interior of the plane more natural. It takes only a short time for the birds to become accustomed to the feeder. They will visit it daily in the winter. The chickadees are especially fond of the aeroplane feeder and claim it as their own.

#### TROLLEY FEEDER

The trolley feeder is handy as it can be moved about. (Plate XXIX.) It can be placed on a wire or clothes line. The hooks, as shown in the drawing, are for holding the suet. The bottom of the feeder will hold considerable food, such as ground seeds

and nuts. The birds soon become accustomed to this feeder and come to it without fear.

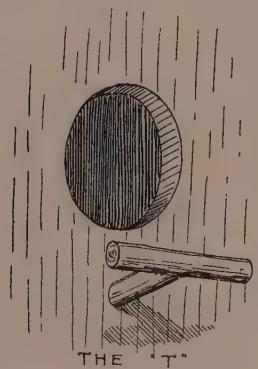
#### SPARROW TRAP

The sparrow trap on Plate XXX, works in the following way. The sparrows prefer this type of house to many others. Place the house on the side of a pole, six or eight feet above the ground. Let the sparrows take possession and build. After the eggs are laid and the female sits on the nest, it is time for action. Be sure the female is on the nest. Slip your hand cautiously under the roof of the house and close the entrance with the hand. Slide out the platform of the house, reach down into the interior and seize the bird. Dispose of her and destroy the eggs. The male sparrow does not grieve long for his mate. In a few days he will return with a new female. Repeat this process of extermination when possible. A great number of sparrows can thus be destroyed in a season.

This house was taken from Government Bulletin 609 as a suggestion for a home for wrens or house finches.

## PERCH DESIGNS

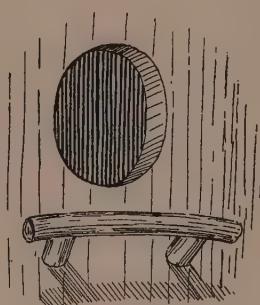
PLATE XXXI



THE 'T'



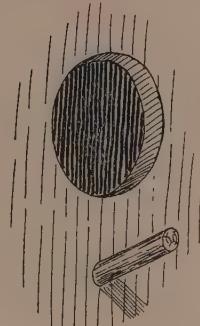
BENT TWIG



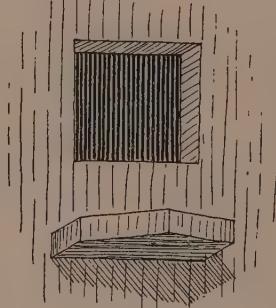
CRESCENT



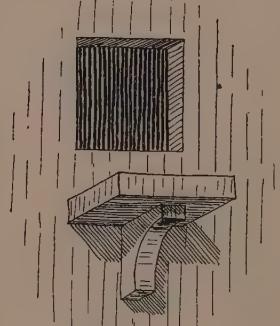
CONTINUOUS



PERCH POLE



SHELF

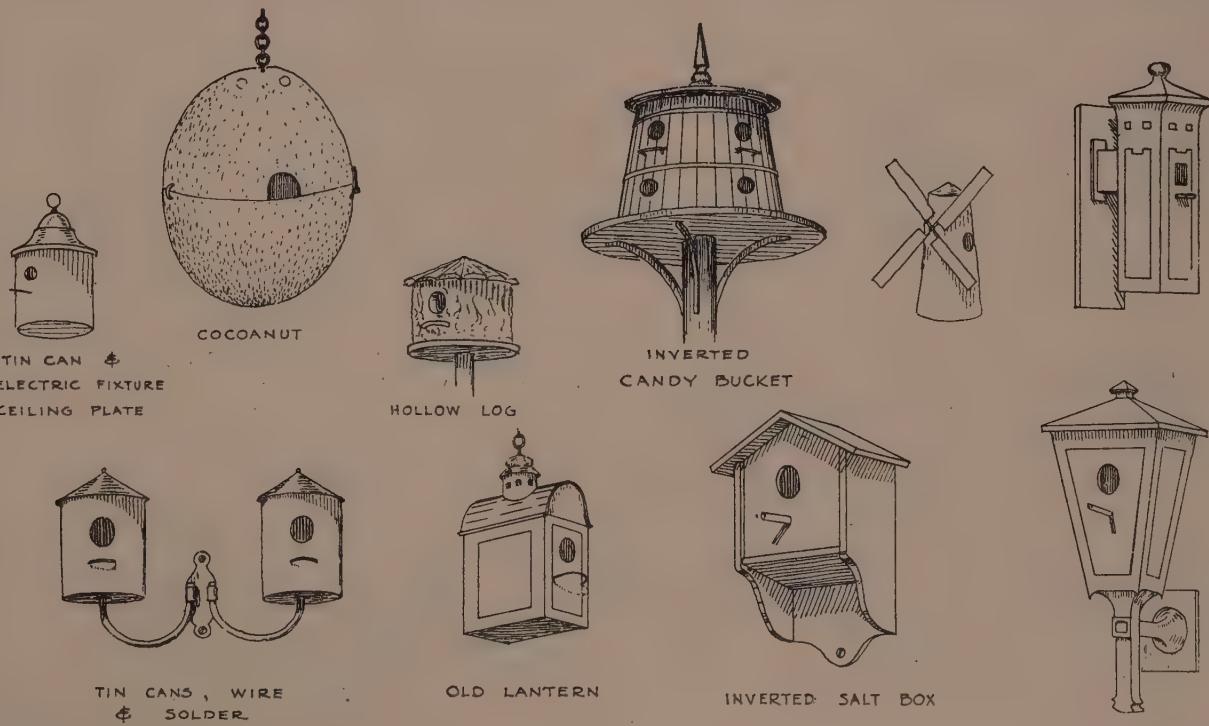


BRACKET



PORCH

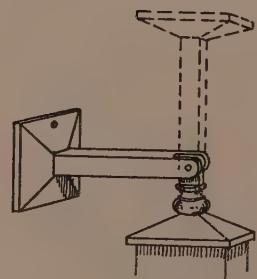
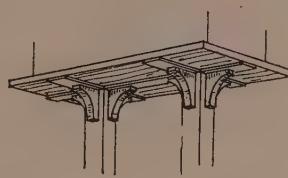
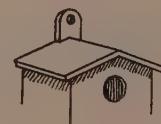
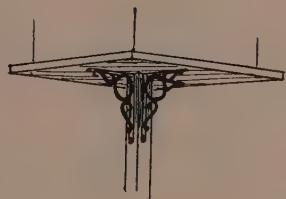
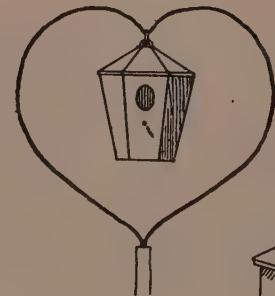
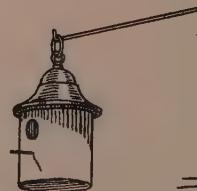
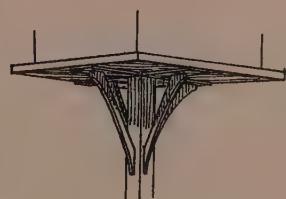
## PLATE XXXII



## BIRD HOUSE SUGGESTIONS

## SUGGESTIONS FOR HANGING AND PLACING BIRD HOUSES

PLATE XXXIII



## BIRD HOUSE CONTESTS

The holding of bird house contests is becoming very popular. Contests have been held from time to time by various organizations in different communities with great success.

A contest properly managed has three aims.

1. Educational aim
  - a. Skill and improvement of students in
  - b. Manual training,
  - c. Bird study.
2. Economic
  - a. Bird protection and its value,
  - b. Increase in the number of nesting boxes,
  - c. Value of these houses to the community.
3. Aesthetic
  - a. Love of nature,
  - b. Improve appearance of yards, parks, etc.,
  - c. Increase in bird songs.

Such a contest may be conducted by a nature lover, or any organization in the community such as

a commercial club, a bird club, a women's club, or a school. The cooperation of the community is necessary to make the contest a success.

Rules governing contest.

1. Contest is open to all boys and girls under eighteen years of age.
2. Houses shall remain the property of the ones who make them.
3. Houses must be constructed by the entrees themselves.
4. All houses must be entered by a specified time, before the nesting date, to allow their being properly placed in time for nesting activities.

The houses should be judged by competent judges; that is, the judges should be nature lovers who fully understand bird habits as well as the principles of manual training. This allows the houses to be judged from two standpoints; mechanical construction, and also as to the requirements of the bird. The score card on Page 60 for judging bird houses can be used to good advantage. The comparative form of judging is the one generally used. By the use of the score card time is saved, for, when a judge

has examined a house, he adds up the number of accumulated points and is through with that house. After all houses are judged, those having the greatest number of points as winner should be selected.

Suitable prizes should be decided upon by the ones holding the contest. Money is sometimes given. Bird books, subscriptions to a nature magazine, or a pair of field glasses make valuable prizes. The house builders should be encouraged to continue studying along this line.

OUTLINE FOR A SCORE CARD FOR JUDGING  
BIRD HOUSES

1. Correct amount of floor space.....	5 points
Depth of nest.....	10 "
Width of nest.....	3 "
2. Distance of entrance from floor.....	5 "
Entrance countersunk, rounded.....	2 "
Correct sized entrance.....	15 "
3. Ventilation.....	3 "
4. Cleaning .....	10 "
5. Perches, round .....	3 "
Martin porch, wide .....	3 "
6. Construction	
Tight joints .....	3 "
Good roof .....	10 "
Nails and screws covered with putty.....	3 "

7. Kinds of material	
Cypress wood	
Pine—well seasoned, good condition.....	8 "
Poplar	
8. Finish	
Paint.....	6 "
Stucco .....	2 "
Rustic, bark or stain.....	4 "
9. Design.....	3 "
10. Interior	
Sandpapered, smooth .....	2 "
Free from nail points.....	3 "

BIRD HOUSE CONSTRUCTION AS A  
MANUAL TRAINING PROJECT

Bird house construction makes good project work for pupils taking manual training. The work offers several problems that can be worked out by the class. A number of tools are used in making a house and the pupils can be taught the various tool processes. Originality of design can be developed by allowing the pupil to use his initiative and ingenuity to a certain extent. Materials can be studied to determine the kind best suited for bird house construction.

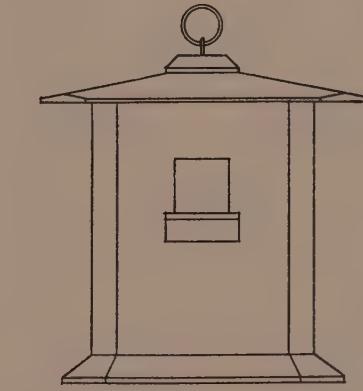
Some instructors consider bird house making poor project work, because they say pupils are not inter-



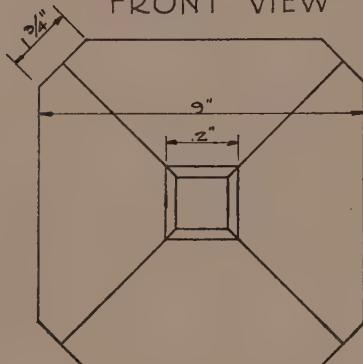
BLUE BIRD HOUSE

## BILL OF MATERIAL

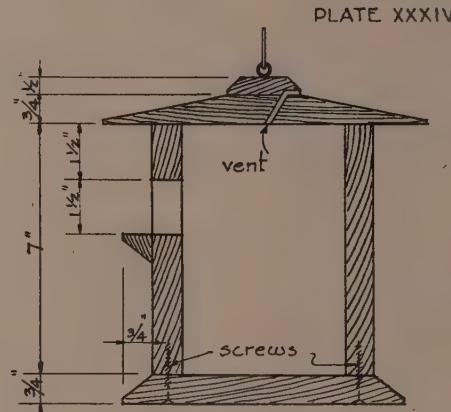
- 1 PC  $3\frac{1}{4}'' \times 7\frac{1}{2}'' \times 7\frac{1}{2}''$  BOTTOM
- 2 PC  $3\frac{1}{4}'' \times 4\frac{1}{2}'' \times 7''$  FRONT & BACK
- 2 PC  $3\frac{1}{4}'' \times 6'' \times 7''$  SIDES
- 1 PC  $3\frac{1}{4}'' \times 9'' \times .9''$  TOP
- 1 PC  $\frac{1}{2}'' \times 2'' \times 2''$  CAP
- 1 PC  $3\frac{1}{4}'' \times \frac{3}{4}'' \times 2''$  PERCH
- 1 1" RING AND SCREW EYE
- 4  $1\frac{1}{2}''$  SCREWS



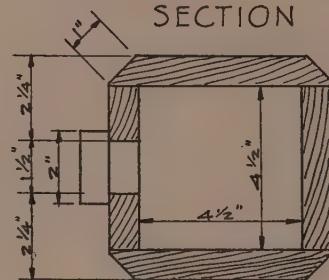
FRONT VIEW



TOP VIEW



SECTION



PLAN

Scale — = 1"

ested and the making of houses has been worn out. A common mistake is that each pupil is required to make a certain kind or type of house. He should be allowed to make the kind of house in which he is most interested.

Before starting the work the builder should select his plan or construct a plan of his own. A little nature study may well be correlated with manual training. Each pupil should make a thorough study of the bird whose house he is building. A good book on birds may be used to good advantage.

If a certain boy is interested in a martin house, and there is one in the community which is built on the right plan, take the boy to see the house. Talk to the owner of the house, who can tell the habits of birds from experience. This gives the pupil an inspiration. In most every community you can find different types of houses that can be visited and studied. Make the pupils realize the economic importance of building bird houses. If bird study is correlated with manual training, you will have no difficulty in keeping the pupils interested.

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# Boy Birdhouse Architecture

Leon H. Baxter

Designed to encourage a liking for birds, and to teach something of their habits, how to construct and put up houses to attract the various kinds of birds, and how to conduct birdhouse contests. Illustrated with half-tones and twenty plates of drawings showing details of design and construction of birdhouses and feeding devices.

\$1.25

Permanent Bird Houses  
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## Toymaking

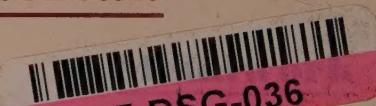
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